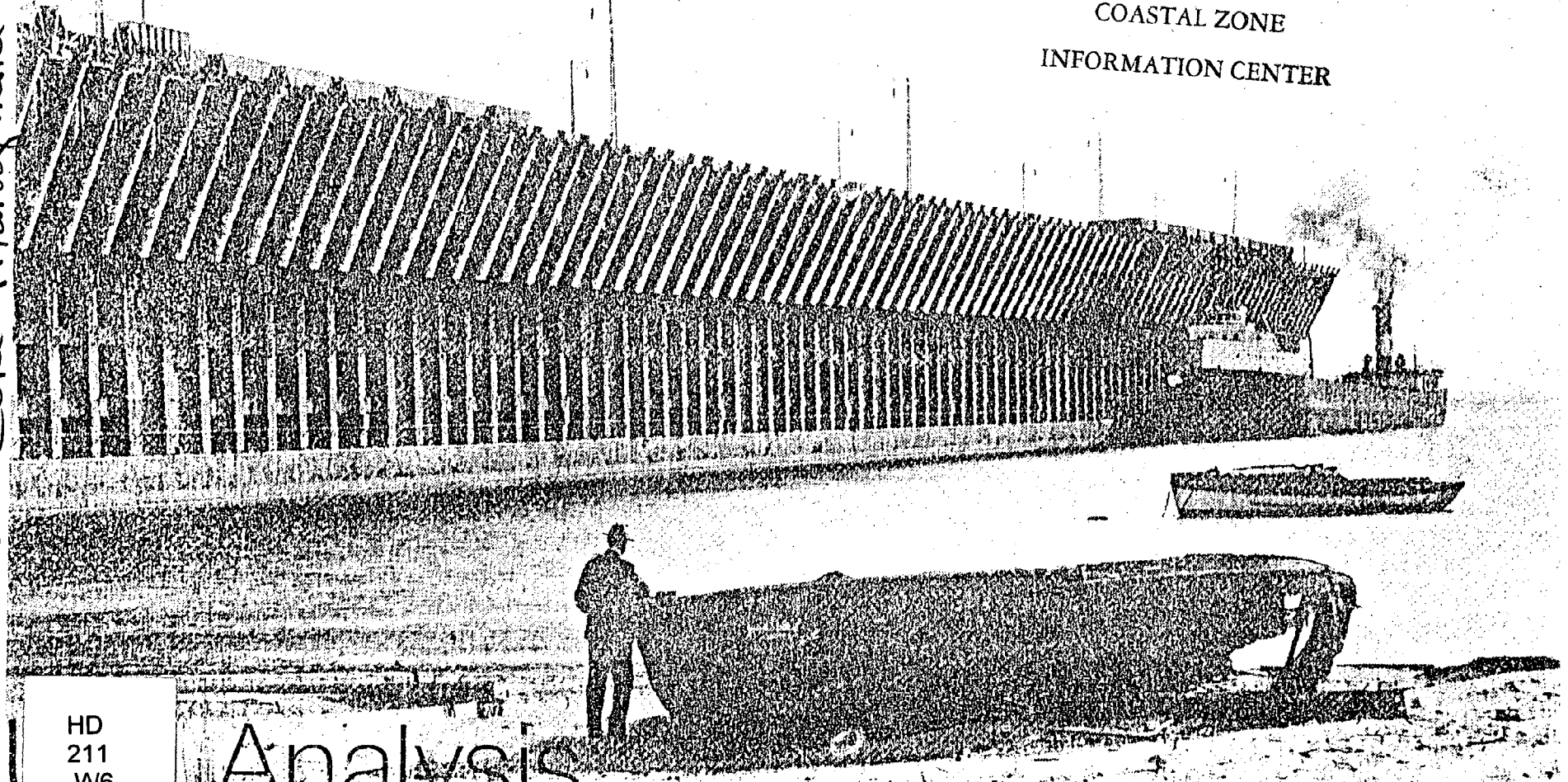


Wisconsin Coastal Zone Management Program

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Analysis Ore Dock / Hog Island

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NP Ore Dock/Hog Island Use Analysis

A Review of Potential Uses of Lands and Structures in the Eastern Waterfront of the City of Superior

June 1982

U. S. DEPARTMENT OF COMMERCE NOAA
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Prepared for:

Northwest Regional Planning Commission
Arrowhead Regional Development Commission
Metropolitan Interstate Committee

With funds provided in part by:

Wisconsin Coastal Management Program

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Introduction

The Duluth-Superior Harbor has been the subject of intensive planning efforts conducted by the Metropolitan Interstate Committee, a body comprised of local elected officials and citizens selected by the local units of government. Acting on behalf of the local communities of Duluth and Superior, the MIC has approached the harbor as a single physical entity and has strived in their planning to minimize the effects of State and Municipal boundaries and to maximize the land use, water use and management benefits of looking at this resource as a whole. The Harbor Plan that resulted from this planning effort was adopted by the following units of local government in early 1978:

Superior Board of Harbor Commissioners
Superior City Council
Seaway Port Authority of Duluth
Duluth Planning Commission
Duluth City Council

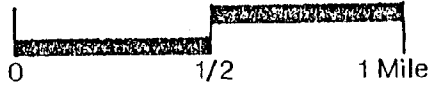
In Superior's eastern waterfront, Hog Island, the Northern Pacific Ore Dock (now owned by the Burlington Railroad but still referred to as the old NP Ore Dock) and the mouth of the Nemadji River each was identified in the plan as being appropriate for different uses. Hog Island is classified for "Conservation (Specific Management)", the Ore Dock for "Commercial, Retail/Service" and the mouth of the Nemadji and surrounding lands for "Dedicated Open Space". The Plan says however, that if commercial use of the Ore Dock does not appear feasible and if shipping related uses are, it is considered to be available for the latter use.

The purpose of this Report is to look at these three areas in greater detail to:

1. Identify special constraints for uses based on existing conditions.
2. Identify possible uses for these areas.
3. Identify points of conflict for these uses based on a) problems within a given site and b) problems resulting from an action on an adjacent area.
4. Recommend a possible direction for future uses.

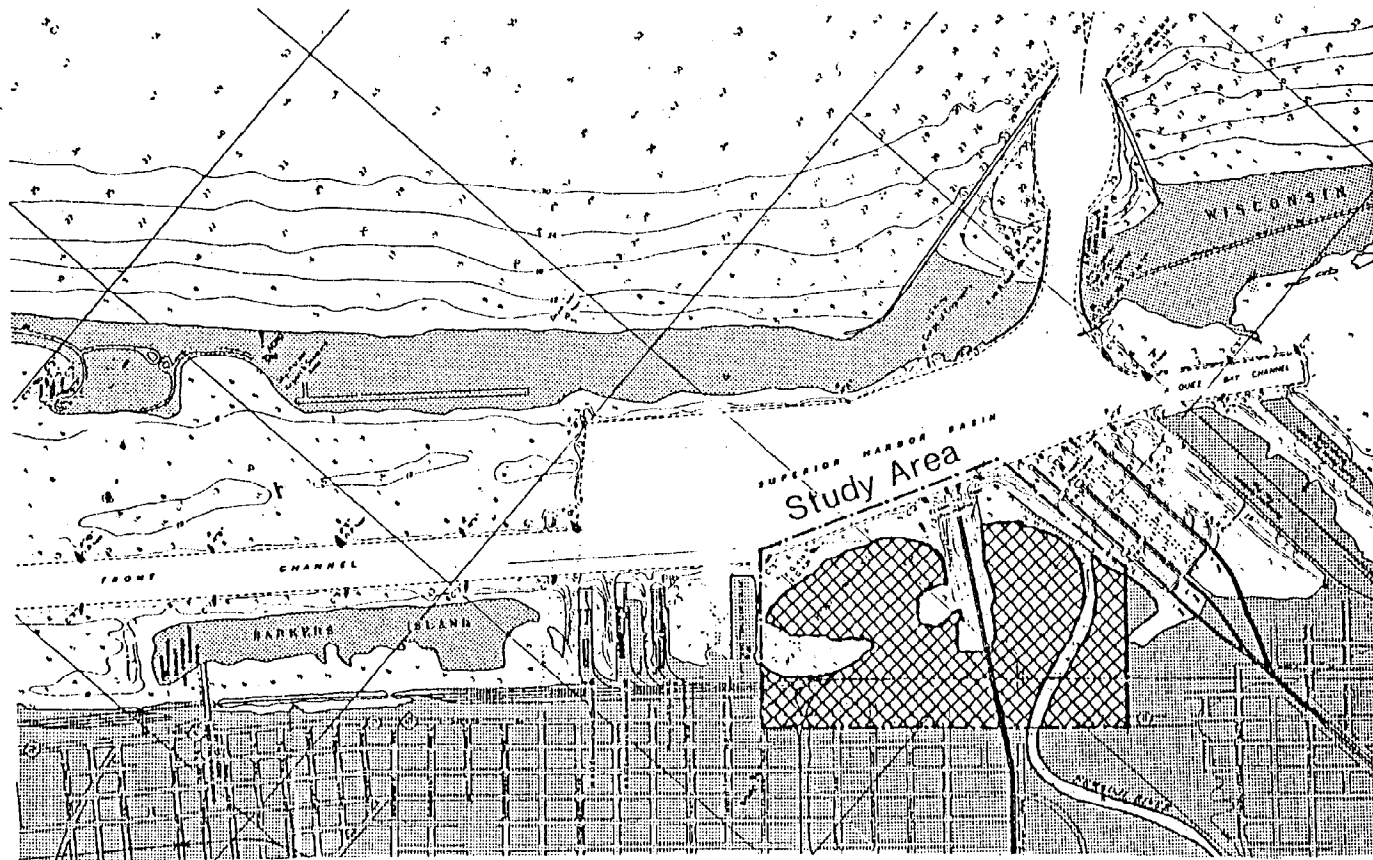
As development potentials or natural resource management questions arise, this ground work will assist by having identified the major concerns for future uses in these areas.

NP Ore Dock/Hog Island Use Analysis 1



June 1982

Study Area Location



The Existing Condition

Historically, this area was predominantly wetlands. The dry land known as Hog Island is one of several dredged material disposal islands created in the harbor over the years. Dating the creation of the island is not precise but charts from the 1920's show much of the island was present at that time. Dredged material has been added over the years with the last being in the mid 1960's.

The land area west of the ore dock and below the Burlington Northern tracks is about 70 acres. This includes Hog Island, the wetlands and the dry land below the tracks to the east of the dock. The land area on either side of the Nemadji River below the tracks is also about 70 acres.

The primary focus of this study is on the lands that are undeveloped. The study area also includes lands up to 2nd Street however, to address availability of utilities and access.

Physical Development

The prominent built feature on the site is the ore dock and approach trestle, the condition of which will be addressed in more detail later. As an historical note, the dock exhibits a change in its structural system about 1/3 out its 2,000 foot length which suggests that the dock was built in at least two stages. Harbor charts from the 1920's support this as they show a much shorter dock. Other features include the old office and parking area for the dock operations located to the west of the trestle gaining access from 2nd Street at about 30th Avenue; Burlington Northern trackage and bridge over the Nemadji River; several residences and commercial uses along 2nd Street; and a fishing

platform on the west bank of the Nemadji just downstream from 2nd Street. The remaining land area is undeveloped.

Utilities

Utilities on the site itself are few. Water, gas, and sanitary sewer exist in the 2nd Street corridor as shown on Map 2. Storm Sewers run from several intersections along 2nd Street to outfalls above the BN tracks. City plat maps make reference to a 4" water line to serve the ore dock from 30th Avenue and 2nd Street. The condition of this line is unknown. Sewage from the dock operations was discharged into the bay. The electrical needs of the dock included 25 cycle power for the hoist machinery. It is unknown whether this power was purchased off site or perhaps generated on site in the concrete building at the base of the approach trestle. Presently, there is electric service to the site in the form of a primary service. The cycle and voltage characteristics are unknown but it appears to be part of the municipal system to power the aids to navigation on the end of the dock fender. On Hog Island there is an overhead secondary line which powers the range lights on towers standing off the beach, marking the down-bound course in the Superior Channel.

Zoning

The zoning line separating the Heavy Industrial Zone and the Two Family Residential Zone is also shown on Map 2.

NP Ore Dock/Hog Island Use Analysis 2



0 500' 1000'

June 1982

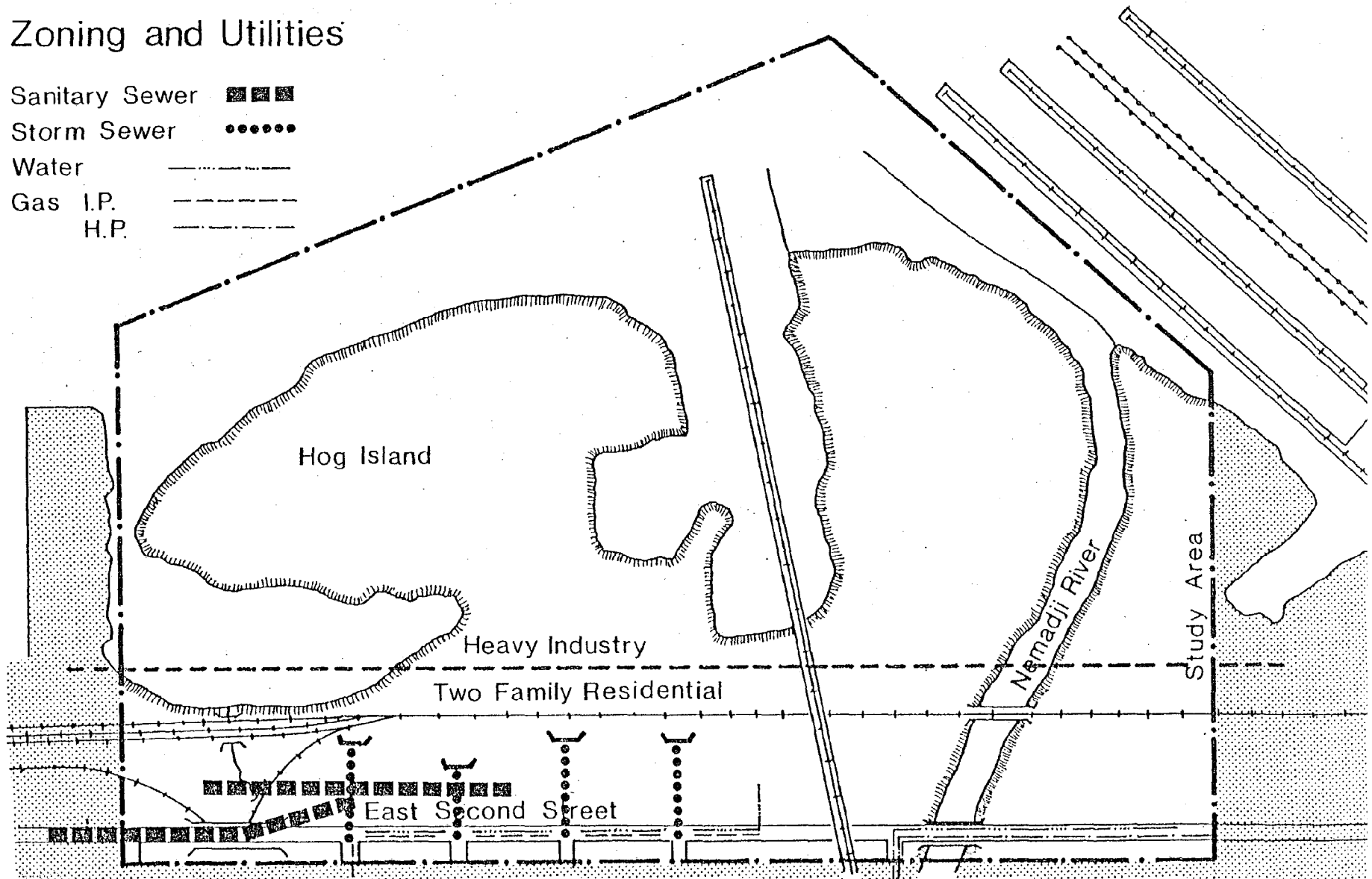
Zoning and Utilities

Sanitary Sewer ■■■■

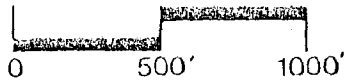
Storm Sewer ●●●●●

Water ————

Gas I.P. - - - - -
H.P. ————



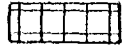
NP Ore Dock/Hog Island Use Analysis 3



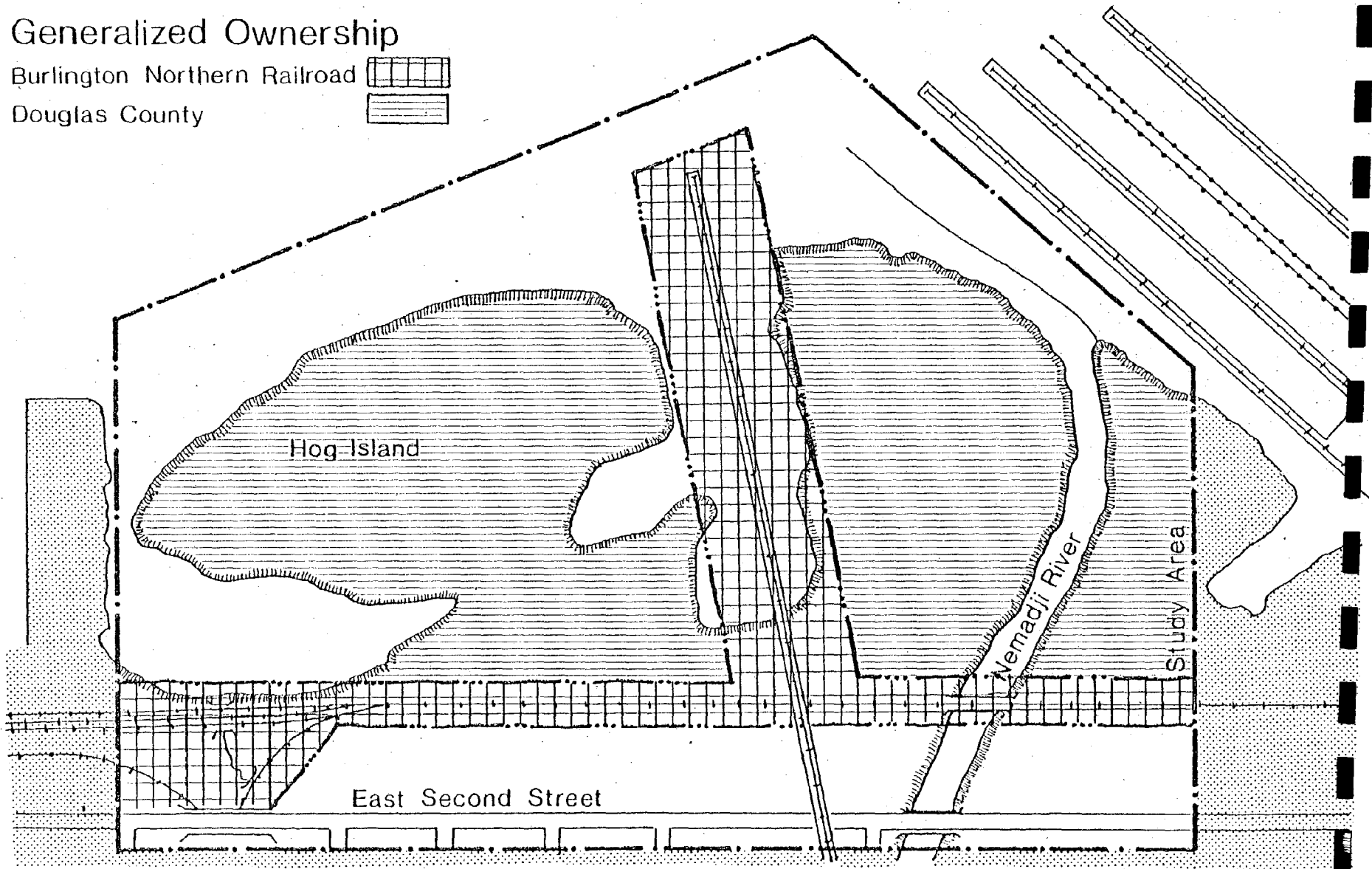
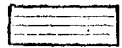
June 1982

Generalized Ownership

Burlington Northern Railroad



Douglas County



Recent action of the Wisconsin Assembly would require zoning of shoreland wetlands in cities and villages. "Shorelands" lie within 1000 feet of a lake or within 300 feet of a river. The Wisconsin portion of the harbor is considered a river. Assembly Bill 839 would mandate zoning by local ordinances of shoreland wetlands of 5 acres or more. This would limit activities in these areas to those which would not adversely affect the natural functions of the wetland. Although not yet in effect, significant restrictions on the use of wetlands can be anticipated.

Ownership

The generalized ownership of the area is shown on Map 3. The area between the BN tracks and 2nd Street is a pattern of small parcels of ownership including the City of Superior, Douglas County, the Burlington Northern Railroad and private individuals. The entire area is platted lands with street rights-of-way extending to the harbor line. There does not appear to be any vacation of these easements except for an unnamed 50 foot wide easement running through the westerly end of Hog Island.

It is interesting to note that the avenues running down to the harbor line were platted at a width of 100 feet; a width intended to make them usable as slips, with the adjacent block filled in as piers served by a 50 foot wide easement in the center.

Access

Access to the Study Area is from the harbor and 2nd Street. 2nd Street is a principal arterial

in the City of Superior also carrying the designation of U.S. Highway 2 and 53. It is a four-lane roadway with no parking. Records in the City Engineers office indicate vehicle operating speeds in this section range from 35-40 MPH, traffic volumes of about 23,000 vehicles (Average Daily Traffic) and a vehicle to capacity ratio of 0.86 - 1.00.

Access to the dock itself is from two points. On the west side a roadway leads to the office for the dock operations and its adjacent parking lot. All of these facilities are abandoned. On the east side, a roadway leads down to the base of the dock at the shore level.

Present Use of Dock

The dock is presently idle, although it occasionally is used as a temporary berth. In the past, vessels to be scrapped were left there for a fee of \$100 per vessel per month.¹ There does not appear to be any on-going maintenance to the structure. The annual real estate tax for the parcel that includes the dock and adjacent waters is just under \$8000.²

¹ Representative, U.S. Steel Great Lakes Fleet, Inc.

² Assessors Office, City of Superior.

Structural Condition of Dock

A field inspection of the dock and trestle structure was conducted in November, 1981. Detailed engineering analyses would be required to review the structural needs for any specific re-use that might be considered. The following field inspection notes give an indication of the overall condition of the facility:

1. Stairway at inner end of dock, wood treads severely rotted. Steel railing and stringers appear in fair condition.
2. Transition section, ballasted deck, vegetation growing through the ballast, structure not exposed for inspection.
3. Dock proper, inner 1/3, steel structure with concrete center and side walks. Wood machinery decks, concrete bin floors and partitions, steel semi-circular bin fronts.
4. Concrete walks in fair to good condition.
5. Wood machinery decks poor to very poor condition with widespread rot.
6. Hoist machinery exposed to weather and appears totally inoperative. Drive motors are 25 cycle.
7. Track support beams appear to be in fair to good condition. Build up of ore and dirt on bottom flanges of

track beams where they bear on partition walls has caused considerable corrosion in these areas. Needs cleaning and individual inspection.

8. Walkway at pocket door level is wood and is moderately to severely rotted.
9. Spouts appear to be in generally good condition. Flat cable holding spouts are severely weathered and rusted.
10. Outer 2/3 of dock is concrete supporting structure with concrete bin fronts. Both appear to be in good to very good condition.
11. Outer section of dock has wood plant side and center walks, which are in poor condition.
12. Stairway at outer end of dock down to fender has severely rotted wood treads; stringers and railing good.
13. Fender appears to be in good condition down to the water line with only moderate spalling of concrete. No inspection made below water line.
14. Concrete columns and piers in outer section of dock are in good to very good condition. Concrete appears sound with only minor spalling.

15. Steel columns and cross bracing in inner section of dock in good condition. Much surface rust due to lack of paint, but little severe corrosion.
16. Approach trestle, heavy timber structure on concrete foundations with wood deck and single track.
17. Trestle in very good condition with no evidence of rot.
18. Concrete footings good, no evidence of excessive settlement.
19. Wood deck is rotted and in poor condition. Wood track beams beneath decking are probably also rotted.
20. Portion of trestle adjacent to 2nd Street should have detailed examination for damage and rot caused by salt and water.

Generally, the dock structure appears to be in good condition. Only the exposed horizontal surfaces (decks and walkways, etc.) show severe deterioration. All or most of these would have to be replaced if the dock were to be used for any purpose. As these are removed, the supporting structure could be more closely inspected and repairs made where needed.

Soils

The soils within the study area as classified by the Soil Conservation Service are shown on Map 4. The predominant types include:

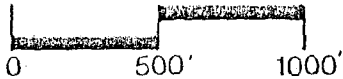
Loamy Aquents (Type 114) - these soils characterize very poorly drained wet bottomlands and are representative of the wetland areas which historically dominated the shoreline in this area. Wetland wildlife habitat is the prevalent feature of these soils. They are unsuitable for building development and general recreational use.

Beaches and Wet Beaches (Type 55 & 55W) - These areas are medium to coarse sand and are well drained. They represent the deposition of dredged materials through the past 75 years or so of harbor maintenance. Organic matter varies and the ability to support various types of vegetation varies accordingly. Generally utilized for recreational purposes, they also have good capacity for building development if sewage treatment is off site, or well removed from surface water. Dredge materials, such as the subject site, are known to have exceptional potential for openland wildlife habitat, in particular as nesting habitat for various colonial bird species (Davis and Niemi, 1980).

NP Ore Dock/Hog Island Use Analysis 4



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June 1982

Soils

From U.S. Soil Conservation Service

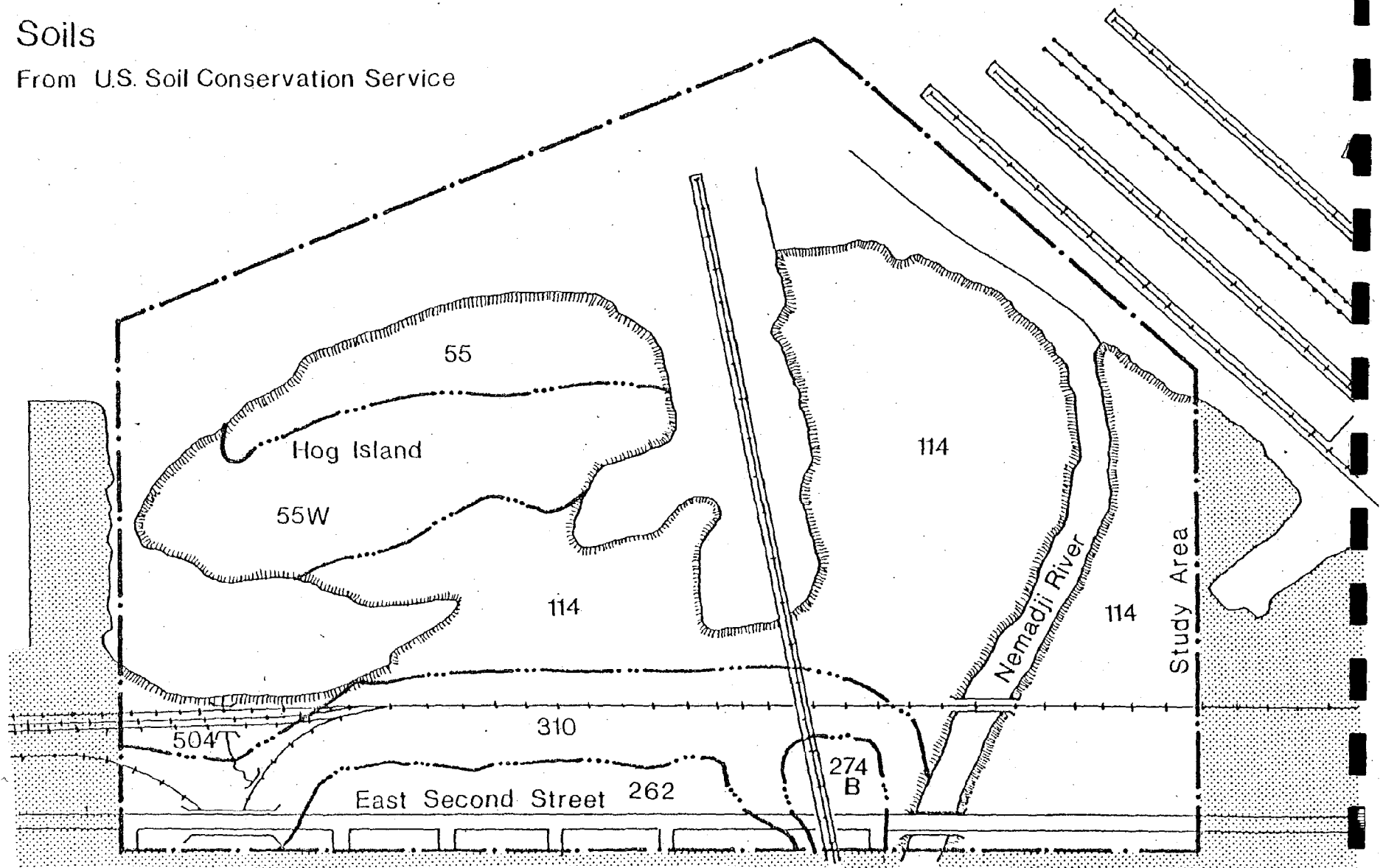


Table 1. Summary of soil analyses, Hog Island.

Soil Type	Number of Samples	pH	Mean values in lbs/acre			
			P	K	Ca	Mg
Sandy inner island	4	6.5	22	36	510	59
Humic topsoil from wooded areas	2	6.7	17	298	3073	465
Underlying sand from weeded areas	2	6.5	17	58	667	64

P = Phosphorus

Ca = Calcium

K = Potassium

Mg = Magnesium

Source: Ecological Research Services, Inc.
Iron River, Michigan

Due to the potential of Hog Island as a colonial bird nesting site, several soil samples taken from the top six inches of the island were analyzed. These results are presented in Table 1. Although the island is basically sandy dredge material, the wooded areas do have a surface layer of from three to five inches of organic material.

Udorthents (Type 310) - These soils form steep side slopes and edges for waterways. They are heavy, clayey, and have low permeability. These soils do not support large trees or woodland wildlife habitat. They generally support vegetation such as weeds, grasses, low shrubs, and trees. Erosion potential is great.

Vegetation

The vegetation within the study area is a mosaic of several types including cattail-sedge marsh, emergent aquatic marsh, sapling trees and shrubs, weedy-grassy areas, sandy beach, and hardwood forest (Map 5). Much of the area reflects the fact that it has been repeatedly disturbed during the past 100 years (e.g., construction activities, dredge deposition). Thus the plant species and general vegetation types present are typical of early successional stages. The exceptions to this are the marsh areas.

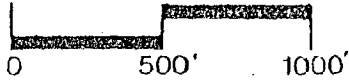
The general description of each major vegetation type is given in Table 2. The hardwood forest areas are predominantly young Populus spp (e.g., aspen and balsam poplar), while the shrub portions are pri-

marily alder (Alnus rugosa) and/or willow (Salix spp). A few large willow trees are interspersed in the hardwood areas on Hog Island. The grassy-weedy areas include sandy herbaceous vegetation which is found on the inner parts of Hog Island and is comprised of species such as are found in similar sandy areas on Minnesota Point (e.g., Russian thistle, goosefoot species), and disturbed areas such as near the beach.

Two marshes exist within the study area. The first lies between Hog Island and the mainland and the second on the west bank of the Nemadji River extending from the Burlington Northern railroad bridge to the mouth of the river. Both are primarily cattail-sedge vegetation, although borders of emergent vegetation are also present. The emergent vegetation at the Hog Island site is comprised of a wide belt of arrowhead (Sagittaria spp), while that adjacent to the Nemadji site is primarily horsetail (Equisetum fluviatile). The latter actually is not continuous with the cattail-sedge area since it lies in the shallow shoreline waters of the river and is isolated from the main marsh by the river bank. Data pertaining to the vegetation in these marshes were collected by the U.S. Fish and Wildlife Service, Migratory Bird and Habitat Research Laboratory during 1979 and 1980 (Davis and Erwin, in preparation).

The earliest survey map of the harbor (1862) indicates that the marshes in the study area were present at that time and apparently are long-time features of the area. However, it does appear that the deposition of materials which eventually became Hog Island has changed the adjacent wetland over the years. Aerial

NP Ore Dock/Hog Island Use Analysis 5



June 1982

Vegetation Distribution

- Emergent Aquatic Marsh
- Cattail-Sedge Marsh
- Hardwood Forest
- Shrubs & Saplings
- Weedy-Grassy
- Sandy Beach

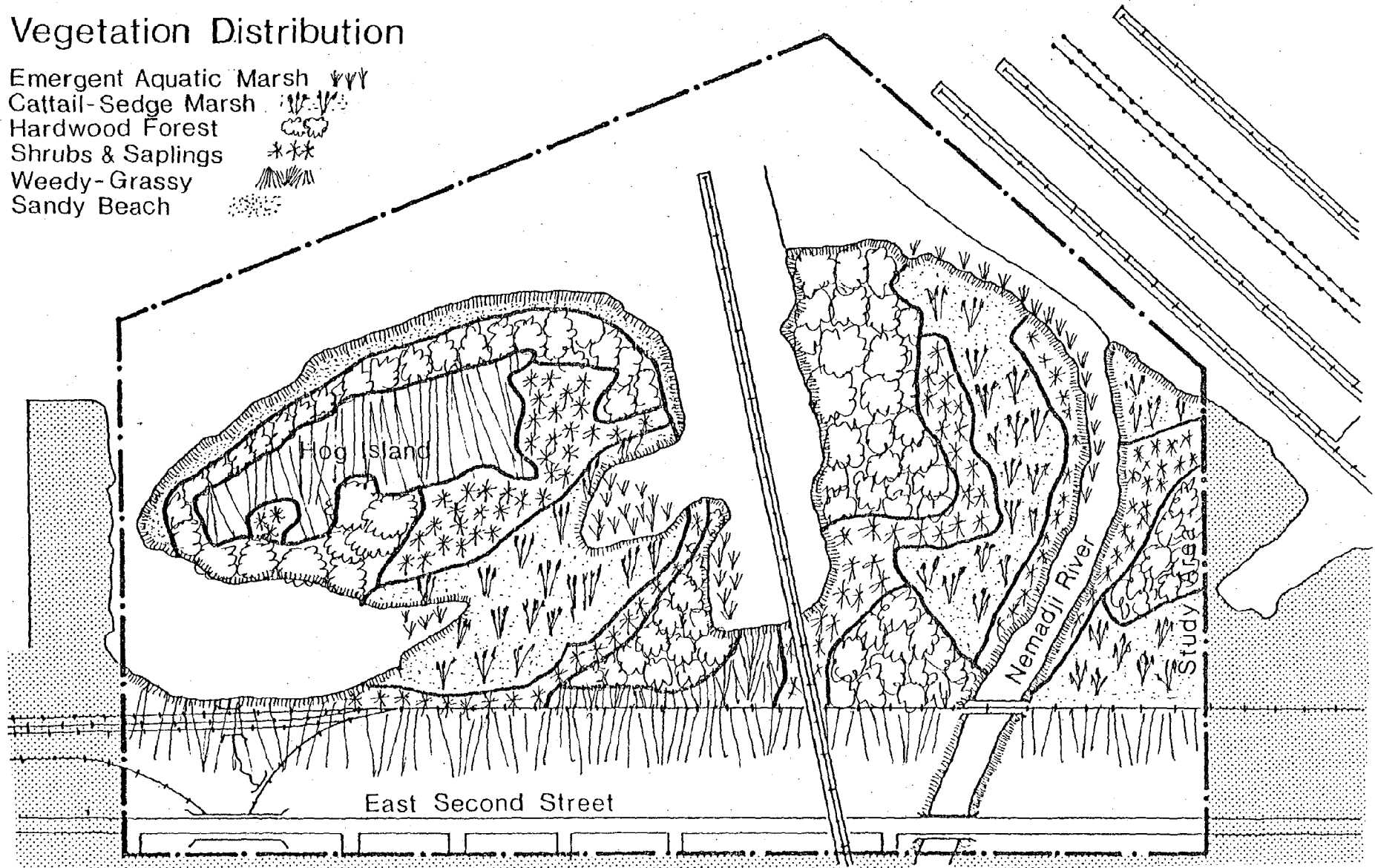


Table 2. Description of major vegetation classes used in making map of area.

Vegetation Type ¹	Description
Emergent Aquatic	Non-persistent hydrophytic vegetation that grows above water. Nemadji site - primarily <u>Equisetum fluviatile</u> , Hog Island site - primarily <u>Sagittaria latifolia</u> .
Cattail-sedge Marsh	Wetland dominated by vegetation types that normally remain standing at least until the beginning of the next growing season (e.g., <u>Typha spp.</u> , <u>Carex spp.</u>).
Sandy Beach	Bare or sparsely vegetated areas consisting of sloping landforms generated by waves and currents and primarily composed of unconsolidated sand, gravel, or cobbles continuous with the shoreline.
Grassy - Weedy	Land covered with grasses (<u>Graminea spp</u>) and other narrow-leaved plants and/or broad-leaved herbaceous plants.
Shrubs and saplings	Land covered with low, woody vegetation less than 2.5 cm in diameter at breast height and/or young trees between 2.5 cm and 7.5 cm in diameter at breast height.
Hardwood Forest	Land covered by at least 10% tree crown coverage and dominated by broadleaf deciduous species.

¹ Classified and described in conjunction with "A classification manual for land cover and land use in Minnesota" by Minnesota State Planning Agency (1978), and "Classification of wetlands and deepwater habitats of the United States" by L. M. Cowardin et al., U.S. Fish and Wildlife Service (1977).

photos taken in 1962 show open water rather than marsh between the Island and mainland. Subsequent photos (1964) show that deposited dredge material bridged the open water to the mainland. The presence of the existing marsh is not a continuance of historic wetlands, but a re-established marsh after the deposition of dredged material was completed.

To our knowledge, no rare, threatened, or endangered plant species (state or federal) are present on the study area. However, with the exception of the marsh sites, no intensive sampling has been conducted. Our reconnaissance of the area did not uncover any such species, but a more thorough study would be required to make an adequate assessment. Our work included only a cursory examination of the area which was further limited by the fact that our observations took place within the time constraints of the contract period (Oct. to May). Searches thus did not occur during the growing and/or flowering season when herbaceous plants are more easily observed and identified.

Although it seems unlikely that any threatened or endangered species exist within the area under consideration, one species of Grass of Parnassus (Parnassia palustris) does deserve mention in this regard. This plant is listed as threatened by the State of Wisconsin and to this date has been found at only one site in the state - Barker's Island. This island lies less than one mile northwest of Hog Island, and the vegetation and substrate at the two sites are quite similar. Thus there is a possibility that this species is present on Hog Island also. The Wisconsin DNR considers this species worthy of protection and has taken actions in the past to do so on Barker's Island. WDNR

policy regarding endangered or threatened plants is that "plants may not be removed or transported away from their native habitat on public property or property not owned or leased by the taker except in the course of forestry, agriculture, or the construction, operation, or maintenance of a utility facility". Hog Island is in the public domain (Douglas County).

With the exception of the marsh areas, the vegetation present in the study area is common throughout the harbor and, from a wildlife/habitat standpoint, is considered "low" in value. In contrast, the marshes represent some of the few remaining wetland sites in the lower harbor and are definitely of significance. The Duluth-Superior Harbor Land Use Management Plan (MIC, 1978) explicitly states that marshes within the harbor are to be protected due to their scarcity and importance to wildlife and fishes. Both of the above marsh areas are listed as conservation areas in this document.

Wildlife

Information dealing specifically with wildlife utilization of this site is for the most part limited to one group - the birds. The remaining wildlife groups (e.g., mammals) have not been studied in detail, although incidental observations have been recorded by various parties. General statements about usage by the latter groups can be made by extrapolating information pertaining to nearby areas on the St. Louis River (e.g., Western Waterfront Trail) and overall distributions within the state of Wisconsin and Minnesota.

Birds

The major sources of information regarding bird use of the parcel are Niemi et al. (1978) and Davis and Erwin (in preparation). The first of these includes year-round documentation of bird use of the shoreline including the entire Hog Island site as well as that portion of the lower Nemadji River included in this study. The second document provides extensive information about the breeding bird populations in the two marsh areas. Information pertaining to overall bird use of the Duluth-Superior Harbor is given in Niemi et al. (1978), Davis et al. (1979), and Niemi et al. (1980).

Bird use of the study area primarily includes species which are common and ubiquitous in the harbor. However, exceptional usage has been noted with respect to the two wetland areas and the outer sandy beach of Hog Island. These areas are considered of special significance as described below.

The most outstanding feature regarding the Hog Island marsh is its relatively high utilization by waterfowl in the fall. This area is known to be a fall congregation site for mallard, blue-winged teal, and wood duck, and as many as 200, 220, and 70 individuals respectively have been observed in the marsh. The breeding population is not unique and is dominated by the red-winged blackbird, a common bird in marshes throughout the harbor. Mallard nests have been found in this marsh also.

Bird utilization of the Nemadji River marsh is noteworthy due to the presence of a breeding population of short-billed marsh wrens. While this species is found in many of the sedge marshes in the harbor,

it is not abundant in any. Its status on a nationwide basis is of concern due to regional declines in areas including the Western Great Lakes. Attesting to this is the fact that this species has been placed on the Audubon Blue List - a list intended to delineate those bird species which are potentially headed towards trouble.

The other portion within the study area which has had noteworthy bird use in the past is the sandy beach of Hog Island. This beach is often used by moderate numbers of shorebirds during spring migration (as high as 500 birds/day).

A list of bird species which have been reported on or near the parcel is given in Table 3. We are not aware of any importance of the parcel to threatened or endangered bird species (state or federal), although the aforementioned significance of the short-billed marsh wrens at the Nemadji River marsh and the fact that various parties have noted that Hog Island has potential as a breeding site for common terns and/or piping plovers (both endangered species in Wisconsin) should be noted.

Table 3. Bird species which have been observed on or immediately adjacent to the study area.¹

Common Name	Scientific Name	Status ²
Pied-billed Grebe	<u>Podilymbus podiceps</u>	S,M
Great Blue Heron	<u>Ardea herodias</u>	S,M
Green Heron	<u>Butorides virescens</u>	S,M
American Bittern	<u>Ixobrychus exilis</u>	S,M
Whistling Swan	<u>Olor columbianus</u>	M
Mallard	<u>Anas platyrhynchos</u>	S,M
Black Duck	<u>Anas rubripes</u>	S,M
Pintail	<u>Anas acuta</u>	M
Green-winged Teal	<u>Anas crecca</u>	M
Blue-winged Teal	<u>Anas discors</u>	S,M
American Wigeon	<u>Anas americana</u>	S,M
Northern Shoveler	<u>Anas clyptea</u>	S,M
Wood Duck	<u>Aix sponsa</u>	S,M
Canvasback	<u>Aythya valiserina</u>	M
Lesser Scaup	<u>Aythya affinis</u>	S,M
Common Goldeneye	<u>Bucephala clangula</u>	W,M
Bufflehead	<u>Bucephala albeola</u>	W,M
Hooded Merganser	<u>Lophodytes cucullatus</u>	S,M
Common Merganser	<u>Mergus Merganser</u>	W,M
Turkey Vulture	<u>Cathartes aura</u>	M
Goshawk	<u>Accipiter gentilis</u>	W,M
Broad-winged Hawk	<u>Buteo platypterus</u>	S,M
Bald Eagle	<u>Haliaeetus leucocephalus</u>	S,M
Marsh Hawk	<u>Circus cyaneus</u>	M
Virginia Rail	<u>Rallus timicola</u>	S,M
American Coot	<u>Fulica americana</u>	S,M
Semipalmated Plover	<u>Charadrius semipalmatus</u>	M
American Golden Plover	<u>Pluvialis dominica</u>	M

¹ Compiled from Davis and Erwin (in prep.) and Niemi et al. (1977).

Common Name	Scientific Name	Status ²
Killdeer	<u>Charadrius vociferus</u>	S,M
Common Snipe	<u>Capella gallinago</u>	S,M
Spotted Sandpiper	<u>Actitis macularia</u>	S,M
Yellowlegs species	<u>Tringa spp</u>	M
Pectoral Sandpiper	<u>Calidris melanotos</u>	M
Semipalmated Sandpiper	<u>Caladrus pusillus</u>	M
Dowitcher species	<u>Limnodromus spp</u>	M
Hudsonian Godwit	<u>Limosa haemastica</u>	M
Herring Gull	<u>Larus argentata</u>	P
Ring-billed Gull	<u>Larus delawarensis</u>	S,M
Bonaparte's Gull	<u>Larus philadelphia</u>	M
Caspian Tern	<u>Hydroprogne caspia</u>	M
Common Tern	<u>Sterna hirundo</u>	S,M
Mourning Dove	<u>Zeniada macroura</u>	S,M
Belted Kingfisher	<u>Megaceryle alcyon</u>	S,M
Yellow-bellied Sapsucker	<u>Sphyrapicus varius</u>	S,M
Common Flicker	<u>Colaptes auratus</u>	S,M
Tree swallow	<u>Irotoprocne bicolor</u>	S,M
Blue Jay	<u>Cyanocitta cristata</u>	P
Common Crow	<u>Corvus brachyrhynchos</u>	S,M
Black-capped Chickadee	<u>Parus atricappilus</u>	P
Long-billed Marsh Wren	<u>Telmatodytes palustris</u>	S,M
Short-billed Marsh Wren	<u>Cistothorus platensis</u>	S,M
Catbird	<u>Dumetella carolinensis</u>	S,M
Robin	<u>Turdus Migratorius</u>	S,M
Golden-crowned Kinglet	<u>Regulus satrapa</u>	S,M
Northern Shrike	<u>Lanius excubitor</u>	W
Yellow Warbler	<u>Dendroica petechia</u>	S,M
Palm Warbler	<u>Dendroica palmarum</u>	M
Northern Waterthrush	<u>Seiurus novaboracensis</u>	S,M
Starling	<u>Sturnis vulgaris</u>	P
Common Yellowthroat	<u>Geothlypis trichas</u>	S,M
Yellow-headed Blackbird	<u>Xanthocephalus xanthocephalus</u>	S,M
Red-winged Blackbird	<u>Agelaius phoeniceus</u>	S,M
Brewer's Blackbird	<u>Euphagus cyanocephalus</u>	S,M

Common Name	Scientific Name	Status ²
Rusty Blackbird	<u>Euphagus carolinus</u>	M
Common Grackle	<u>Quiscalus quiscula</u>	S,M
Brown-headed Cowbird	<u>Molothrus ater</u>	S,M
Rose-breasted Grosbeak	<u>Pheucticus ludovicianus</u>	S,M
Purple Finch	<u>Caepodacus purpureus</u>	S,M
Common Redpoll	<u>Acanthis flammea</u>	W
Goldfinch	<u>Spinus tristis</u>	S,M
Junco	<u>Junco hyemalis</u>	M,W
Tree Sparrow	<u>Spizella arborea</u>	M
Clay-colored Sparrow	<u>Spizella pallida</u>	S,M
White-throated Sparrow	<u>Zonotrichia albicollis</u>	S,M
Fox Sparrow	<u>Passerella iliaca</u>	S,M
Swamp Sparrow	<u>Melospiza georgiana</u>	S,M
Song Sparrow	<u>Melospiza melodia</u>	S,M

² Status within the St. Louis River Estuary

S - summer resident

P - permanent resident

M - spring or fall transient

W - winter visitant

Mammals

No studies of mammal use of any of the areas within this parcel have been made, although a list of species seen or identified by sign on adjacent Burlington Northern property was compiled in 1974 (R. F. Weston, Inc., 1974). Mammals using the area are probably similar to those which occur in other comparable sites within the harbor and most likely include common and ubiquitous species such as the eastern cottontail rabbit, snowshoe hare, muskrat, and raccoon. These and other species which are likely to use the area are listed in Table 4.

Although documentation is lacking, it is highly unlikely that any threatened or endangered mammal species (state or federal) occur on this parcel since the three species so listed by the State of Wisconsin require large, mature forest tracts. The only notable mammal sightings regard the river otter which has been reported numerous times near the mouth of the Nemadji River. The status of this species in the general harbor is unknown, but the sightings which have been made certainly represent a unique situation in such a heavily industrialized area.

Reptiles and Amphibians

As in the case of mammals, no studies of the reptile or amphibian populations present on the parcel have been conducted. However, a study of these species in a nearby area of the St. Louis River (Western Waterfront Trail) did include such documentation. Some of the species which occurred in the latter area may also occur within the Hog Island - Nemadji River vicinity, and these species

are listed in Table 5. Although documentation is lacking, it seems highly unlikely that this parcel supports any threatened or endangered reptile or amphibian species (state or federal) since appropriate habitats are not present.

Fish

The major species in the estuary which have been of concern to projects involving any habitat modification are the yellow perch, northern pike, and walleye. Forty-two other fish species have been found (Table 6), but most of these are either ubiquitous forage-size fish, are not dependent on the estuary's near-shore habitat, or have been considered of minor ecological or economic importance. It appears that the abundance of certain sport fish is changing due to recent water quality improvements. However, it will be several years before it is apparent whether these species have established themselves firmly enough to be considered important within the system.

Assessment of the value of the estuary as fish habitat generally takes into consideration habitats used during three distinct life stages. These include adult forage areas, spawning areas, and nursery areas. Depending on the species, habitat requirements may be completely different for each stage. Limitations of any of the three habitat types will limit the production or carrying capacity of the system for a given species. An evaluation of the habitat within the study area must therefore consider not only the types present, but also their value in terms of total availability within the lower estuary.

Table 4. Mammal species which have been observed on or in areas of similar habitat types near the study area.¹

<u>Common Name</u>	<u>Scientific Name</u>
Eastern Cottontail Rabbit	<u>Sylvilagus floridanus</u>
Snowshoe Hare	<u>Lepus americanus</u>
Eastern Gray Squirrel	<u>Sciurus carolinensis</u>
Muskrat	<u>Ondatra zibethica</u>
Raccoon	<u>Procyon lotor</u>
Striped Skunk	<u>Mephitis mephitis</u>
Weasel species	<u>Mustela spp</u>
Mink	<u>Mustela vison</u>
River Otter	<u>Lutra canadensis</u>
Masked Shrew	<u>Sorex cinereus</u>
Norway Rat	<u>Rattus norvegicus</u>

¹ Compiled from R. F. Weston, Inc. (1974) and Nieme et al. (1978).

Table 5. Reptile and amphibian species which have been observed on or in areas of similar habitat types near the study area.¹

<u>Common Name</u>	<u>Scientific Name</u>
Leopard Frog	<u>Rana pipiens</u>
Wood Frog	<u>Rana sylvatica</u>
Boreal Chorus Frog	<u>Pseudacris nigrata</u>
Common Tree Frog	<u>Hyla versicolor</u>
Common Garter Snake	<u>Thamnophis s. sirtalis</u>
Red-bellied Snake	<u>Storeria occipitomaculata</u>
Snapping Turtle	<u>Chelydra serpentina</u>
Painted Turtle	<u>Chrysemys bellii</u>

¹ Compiled from R. F. Weston, Inc. (1974), Niemi et al. (1978), and observations by present staff.

The study area does include a variety of aquatic habitat types and is utilized by many fish species during some stage or stages in their life cycle. Usage will be discussed for several sites within the area including the mouth of the Nemadji River, the deep water adjacent to the Burlington Northern dock, and the shallow water around Hog Island.

That portion of the Nemadji River which lies within the study area does not include any important spawning or nursery areas, although it does provide good seasonal adult walleye forage habitat (May-July) and is used to some extent by northern pike throughout the year. The river system supports seasonal spawning runs by a variety of fish species including the white sucker, longnose sucker, shorthead redhorse, silver redhorse, brown trout, rainbow trout, chinook salmon, pink salmon, rainbow smelt, burbot, and some minnow species.

The deep-water dredged areas around the dock represent a second distinct habitat type within the study area (Map 6). Fisheries studies have not been conducted around this slip, but, in other portions of the estuary, deep-water dredged areas are generally not heavily used by the adults of any game species. Deep-water areas are used during the early life stages (approximately May-June) of walleye, yellow perch, and white suckers and year-round by smelt, but due to the small size of the area under consideration, it cannot be considered of great importance in this regard. It should be noted that the deep-water fishery assessments which have been conducted in the estuary have included channels and other harbor areas, but not slips, and therefore do not necessarily reflect use patterns at the present site.

The shallow areas around Hog Island comprise the third distinct habitat type within the study area to be considered with respect to fish. On the harbor side of the island, these areas consist of a sloping sand bottom in waters reaching a maximum depth of six feet at the edge of the dredged channel (Map 6). There are a few scattered beds of Potamogeton crispus along the beach which occasionally harbor northern pike or yellow perch. Seining conducted along this shore has produced young-of-year yellow perch, walleye, and suckers as well as other forage-size fish species.

The Wisconsin Department of Natural Resources (WDNR) considers this shoreline to be comparable to similar areas of the estuary in terms of value as a nursery area. Shallow, sandy shorelines such as this are preferred areas for young-of-year walleye and are not overly abundant in the Wisconsin portions of the estuary. While it is difficult to quantify the direct impact of eliminating this shoreline's use as a nursery, it is our feeling that it does not qualify as a critical nursery area due to its relatively small size. The nearby shorelines of Minnesota Point and Allouez Bay would probably compensate for any losses caused by alternative uses of this area. This is not to say that this habitat is without value however. The importance of the walleye fishery in the estuary in terms of both economics and recreation dictates that any habitat used by this species be preserved to the extent possible.

The inland side of Hog Island is distinctly different from the harbor side. All of the water is shallow (less than 3 1/2 feet) and much of it is

NP Ore Dock/Hog Island Use Analysis 6

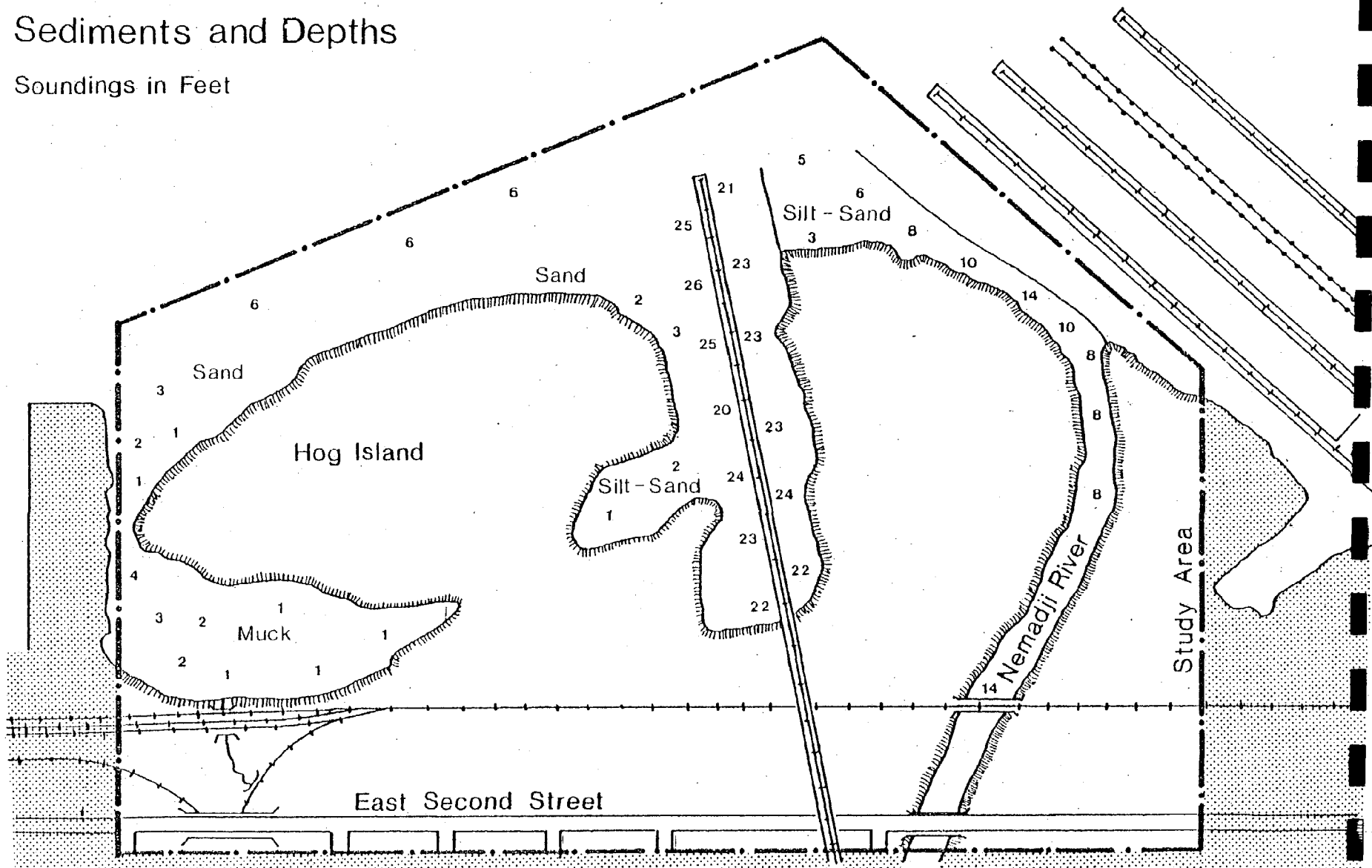


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June 1982

Sediments and Depths

Soundings in Feet



bordered by emergent and/or persistent aquatic vegetation (Map 5). The area is divided by the marshy extension between the mainland and the island. The eastern portion has a silt-sand substrate and scattered submergent vegetation. It primarily supports yellow perch, black bullheads, carp, and northern pike. Its importance as a nursery area is unknown, but it probably is not critical due to the limited size of the area.

The western portion has a substrate consisting primarily of an odiferous black muck which is probably the result of drainage received from Newton Creek over the years. The headwaters of Newton Creek include the Murphy Oil refinery, and while the present discharge from the refinery area is treated and is governed by permit from the WDNR, this has not always been the case. Also, up to the mid-1970's, the city sanitary sewer system periodically discharged into the creek. Although both of these conditions have since been changed, there is a history of discharges into Newton Creek that have contributed to the present bottom condition. It is unlikely that this area is important as a nursery since neither yellow perch nor walleye young favor muck substrates.

Both sides of the marshy area behind the island may be used as a spawning site by northern pike and yellow perch. The WDNR classifies this area as a spawning site for these species. This is a very small area compared to the extensive spawning marshes in nearby Allouez Bay; however. We do not feel that the value of this spawning area should in and of itself preclude other uses, though the habitat should be preserved if feasible.

No threatened or endangered species (state or federal) have been found within the St. Louis River estuary. They therefore are not likely to occur within the study area.

Water Quality and Sediments

Water quality within the study area is quite variable due to the influence of several discharge sources. It is affected by Lake Superior, the ambient water quality within the harbor, the Nemadji River, and Newton Creek.

Ambient water quality within the harbor has changed since the 1979 opening of the Western Lake Superior Sanitary District (WLSSD) facilities. Previous to this time it was not unusual to find severe oxygen depressions throughout the lower harbor during winter and late summer. Low oxygen reflects degraded water quality conditions and especially organic or chemical pollution. This was the result of untreated wastes from the upper St. Louis River and inadequate treatment by the two municipal treatment plants. Upgrading of both treatment plants and treatment of previously untreated wastes have resulted in essentially complete recovery of oxygen levels and much lower levels of microbial pollutants.

One class of pollutants has increased in the study area since the opening of WLSSD. Chlorinated hydrocarbons are being discharged from the treatment plant at much higher levels than in the past. This group of compounds contains potential carcinogens. Regulatory agencies have not voiced

Table 6. Fish species captured in the Superior-Duluth estuary, 1975 - 1981.¹

<u>Common Name</u>	<u>Scientific Name</u>
Yellow Perch	<u>Perca flavescens</u>
Walleye	<u>Stizostedion vitreum vitreum</u>
Northern Pike	<u>Esox lucius</u>
Muskellunge	<u>Esox masquinongy</u>
Rainbow Trout	<u>Salmo gairdneri</u>
Brown Trout	<u>Salmo trutta</u>
Chinook Salmon	<u>Oncorhynchus tshawytscha</u>
White sucker	<u>Catostomus commersoni</u>
Longnose sucker	<u>Catostomus catostomus</u>
Shorthead Redhorse	<u>Moxostoma macrolepidotum</u>
Silver Redhorse	<u>Moxostoma anisurum</u>
Bluegill	<u>Lepomis macrochirus</u>
Pumpkinseed	<u>Lepomis gibbosus</u>
Rock Bass	<u>Ambloplites rupestris</u>
White Bass	<u>Morone chrysops</u>
Black Crappie	<u>Pomoxis nigromaculatus</u>
Black Bullhead	<u>Ictalurus melas</u>
Brown Bullhead	<u>Ictalurus nebulosus</u>
Yellow Bullhead	<u>Ictalurus natalis</u>
Channel Catfish	<u>Ictalurus punctatus</u>
Carp	<u>Cyprinus carpio</u>
Goldfish	<u>Carassius auratus</u>
Smelt	<u>Osmerus mordax</u>
Burbot	<u>Lota lota</u>
Log Perch	<u>Percina caprodes</u>
Johnny Darter	<u>Etheostoma nigrum</u>
Alewife	<u>Alosa pseudoharengus</u>
Freshwater Drum	<u>Aplodinotus grunniens</u>
Trout-Perch	<u>Percopsis omiscomaycus</u>

<u>Common Name</u>	<u>Scientific Name</u>
Brook Stickleback	<u>Culea inconstans</u>
Spottail Shiner	<u>Notropis hudsonius</u>
Emerald Shiner	<u>Notropis atherinoides</u>
Bluntnose Minnow	<u>Pimephales notatus</u>
Lake Chub	<u>Couesius plumbeus</u>
Golden Shiner	<u>Notemigonus chrysoleucas</u>
Common Shiner	<u>Notropis cornutus</u>
Mimic Shiner	<u>Notropis volucellus</u>
Longnose Dace	<u>Rhinichthys catapoctae</u>
Tadpole Madtom	<u>Noturus gyrinus</u>
Stonecat Madtom	<u>Noturus flavus</u>
Lake Herring	<u>Coregonus artedii</u>
Central Mudminnow	<u>Umbra limi</u>
Creek Chub	<u>Semotilus atromaculatus</u>

¹ Compiled from DeVore (1978) and Wisconsin Department of Natural Resources, Superior Harbor Fish Index Station Reports.

great concern regarding their presence, but the effect of present levels of these compounds on the aquatic biota is largely unknown.

The Nemadji River discharge is turbid the entire year, and, depending upon the water level and turbidity at a given time, it may influence only the area immediately adjacent to its mouth or it may affect water well into Lake Superior. Aside from the turbidity, water quality in the river is good. Ninety-five percent of the watershed is forested land, and the lack of agricultural or industrial development results in little degradation. However, the character of the red clay soil through which the river flows does result in both high coloration and heavy sediment loading.

Maintenance dredging in the area impacted by the high sediment load of the river averages near 80,000 cubic yards per year (MIC, 1981). This represents nearly half of the maintenance dredging which occurs in the Superior-Duluth harbor. Any development within the study area which might alter or interfere with present drainage patterns would certainly affect the sedimentation patterns.

Newton Creek is an outfall for portions of the city storm sewer system. Although no specific sampling has been conducted, the typical discharge from a municipal storm sewer system includes various chemical and petroleum residues washed down from streets, alleys, rooftops, snowmelt, and yard areas in the city. The portion of Superior through which the creek flows is not heavily urbanized however, so these effects are probably not great. The other discharge effecting the creek comes from the Murphy Oil refinery. Although treated, the existence of this discharge along with the storm sewer discharge

indicates that the overall water quality of Newton Creek is not that of a natural stream.

Sediment composition within the study area is quite variable. It varies from black organic muck on the west side of Hog Island to sand on the north side and silt-sand on the south. Sediments at the mouth of the Nemadji River are silt-sand. No information is presently available regarding the sediment composition at the dredged slips (Map 6).

Current Recreational Use

Current recreational use of the study area is limited. There is some use of the island by children as a play area, although access, through a high spot in the marsh is difficult. The back side of Hog Island has at least two duck hunting blinds although City ordinance prohibits hunting in this area.

Very little fishing occurs around Hog Island because of the very shallow water behind the island and the very deep water adjacent to the dock. The Nemadji River does support a successful seasonal fishery. Walleye run up the river from late May through July after spawning in the St. Louis River. The size of this run has apparently diminished since improved water quality in the upper St. Louis River estuary has allowed increased residence time in those areas, but the Nemadji still offers a significant fishery for both boat and shore anglers. The city constructed a fishing platform just below 2nd Street to accomodate shore anglers in that area. The river also supports northern pike and occasional muskellunge in this area.

Recreational boating on the bay is increasing. Traditionally, the main centers of recreational boating were in Duluth near the Aerial Life Bridge because of easy access to Lake Superior. Recent improvements in the water quality of the St. Louis and the completion of the Barkers Island Marina about a mile west of the study area, have given new emphasis to harbor and bay cruising, day trips up the river and greater use by small boats. Two historic day trip destinations are in this vicinity; the old Corps of Engineers dock on Minnesota Point immediately across from the study area and the "Power Squadron Dock" to the east of the study area at the end of the Allouez Bay Channel. The Corps dock, which gives access to the undeveloped end of Minnesota Point, receives active use despite its deteriorated condition and limited water depths.

Potential Uses

This section presents an inventory of possible uses within the study area. This listing is the "first cut" and does not attempt to review each idea in detail. The uses that are presented are limited by:

1. The existing conditions on the site.
2. The Harbor Plan.
3. A sense of what might be workable given the location, markets and other harbor facilities.
4. The imagination of the study team.

The study area has three natural divisions; the lands around the mouth of the Nemadji River, the ore dock and Hog Island. The following discussion of uses addresses each of these areas individually. In the case of one area, the choice seems very clear. The other two however, require a more detailed look as provided in following sections.

Mouth of the Nemadji

The Harbor Plan classifies this area as "Dedicated Open Space". There does not appear to be any substantive argument for this land and water area to change from its present use or deviate from its classification in the Harbor Plan. Any change in use would require tremendous alteration which, from a regulatory point of view, would be very unlikely, and from the perspective in intrinsic suitability of the land, undesirable. Wetlands serve a function in the overall harbor scheme and for this area to continue as wetland does not appear to compromise any other harbor activity. Access is limited,

the river is not a potential route of commerce because of its size and bridge limitations, the silt load from the river is high and the costs of changing this area into any kind of developable site would be very high.

The Old NP Ore Dock

The general listing of uses to be reviewed includes the following:

Industrial

Vessel loading of bulk commodities;
natural ore, taconite, coal, wood
pellets, grain.
Berthing for vessels under repair, in
storage or being serviced.
Non-waterfront related industrial activity.

Commercial

Small boat facility.
Shops, restaurant and other related retail.
Hotel, motel.

Residential

Medium density residential development.

Educational

Ship loading museum.

Habitat Management

None considered.

No Action.

Hog Island

The general listing of uses to be reviewed includes the following:

Industrial

- Shipping terminal for coal, grain or other bulk commodities.
- Non-waterfront related industrial activity.

Commercial

- Commercial fishers; aquaculture.
- Restaurant.
- Hotel, motel.
- Boat launch, marina.

Residential

- Single family residential.
- Medium density, clustered (townhouses).

Recreational

- Day use; trails, picnic, small boat access.

Educational

- Wildlife habitat interpretation.

Habitat Management

- Total conservation and protection.
- Habitat Enhancement.

No Action.

Review of Alternative Uses

The preceding section identified potential uses or activities within the study area. This section represents progressively finer "screens" through which these ideas must pass. The level of detail increases as what started as a raw inventory of ideas is filtered down to a final recommendation.

The area around the mouth of the Nemadji is excluded from this section because, as described earlier, there does not appear to be any compelling reason to consider other uses for this area.

AREA	USE	POSITIVE FEATURES	NEGATIVE FEATURES	MORE DETAILED REVIEW?
Dock	Loading Bulk Commodities			
	1. Natural Ore	None Apparent	<ol style="list-style-type: none"> 1. Limited resource, limited market. 2. Extensive dock modifications for conveyor or rebuilding as pocket fed spout system. 3. Dust control needed. 	No
	2. Taconite	None Apparent	<ol style="list-style-type: none"> 1. Present excess capacity in harbor. 2. Extensive dock modifications for conveyor or rebuilding as pocket fed spout system. 3. Dust control needed. 	No
	3. Coal	<ol style="list-style-type: none"> 1. Potential expanding markets, particularly export. 2. BN control of dock and tracks and access to western mines. 3. Utilizes existing structure in lower harbor served by active deepwater channel. 	<ol style="list-style-type: none"> 1. Present local coal terminal operating at about 30% of capacity. 2. Extensive dock modifications for conveyor system. 3. Dust control needed. 	Yes
	4. Wood Pellets	<ol style="list-style-type: none"> 1. Potential expanding markets, particularly export. 2. Clean, easy to handle and load. 3. Utilizes existing structure in lower harbor served by active deepwater channel. 	<ol style="list-style-type: none"> 1. No history of BN involvement. 2. Markets need more research. 3. Extensive dock modifications for conveyor system. 4. Height of fall into vessel may degrade product. 5. Requires protection from direct snow and rainfall. 	Yes

AREA	USE	POSITIVE FEATURES	NEGATIVE FEATURES	MORE DETAILED REVIEW?
Dock	Loading Bulk Commodities			
	5. Grain	<ol style="list-style-type: none"> 1. Potential expanding markets. 2. Opportunity to increase efficiency of grain handling in harbor and thereby strengthen position of harbor. 3. Utilizes existing structure in lower harbor served by active deepwater channel. 	<ol style="list-style-type: none"> 1. BN position unclear. 2. Extensive dock modifications for conveyor or storage system. 3. Dust control needed. 	Yes
	Other Industrial			
	1. Berthing for storage or repair	1. Little capital cost.	<ol style="list-style-type: none"> 1. Underutilization of facility if other markets exist. 2. Removed from traditional centers of vessel repair and maintenance. 3. Potential spills of solvents, petroleum products, other chemicals and various other materials associated with this activity. 	No
	2. Non-water related	None Apparent	1. Consumes waterfront resource for non-waterfront use.	No
	Commercial			
	1. Small boat facilities	1. Plenty of water depth with established sea wall.	<ol style="list-style-type: none"> 1. Dilutes desirable concentration of this activity at Barkers Island. 2. Not adequate protection. 	No

AREA	USE	POSITIVE FEATURES	NEGATIVE FEATURES	MORE DETAILED REVIEW?
Dock	Commercial			
	2. Shops, restaurant, other retail.	1. Unique structure. 2. Prime viewpoint of lake, city and harbor from top of dock.	1. Difficult accessibility. 2. Great costs relative to other sites. 3. Removes existing facility from potential industrial use that is in the lower harbor with access to deepwater channel.	No
	3. Hotel, motel.	Same as above	Same as above	No
	Residential	Same as above	Same as above	No
	Recreational			
	Small boat docking	Same as commercial small boat facility.	Same as commercial small boat facility.	No
	Educational			
	Ship loading museum	1. Ore carrier at railroad supplied gravity spout dock would display the primary activity that built the Duluth-Superior harbor and region. 2. High visitation at Duluth Marine Museum and Superior Whaleback Museum indicates tourist interest in ship display in mid-continent.	1. Very limited season of visitation. 2. Require public funds for establishment and operation. 3. A design problem for safe public access and viewing. 4. Removes existing facility from potential industrial use that is in the lower harbor with access to deepwater channel.	No

AREA	USE	POSITIVE FEATURES	NEGATIVE FEATURES	MORE DETAILED REVIEW?
Dock	<p>Educational</p> <p>Ship loading museum cont.</p> <p>Habitat Management</p> <p>None considered</p> <p>No Action</p>	<p>3. Vessels and other obsolete material available to donate with possible tax benefits to owners.</p> <p>1. Minimal on-going costs.</p> <p>2. No impacts to surrounding area.</p> <p>3. Preserves options for future uses.</p>	<p>1. No revenues.</p> <p>2. May force uses that may be possible here farther up-stream with potential impact on habitat areas, need for expanded dredging etc.</p> <p>3. Continued deterioration of structure.</p>	Yes

AREA	USE	POSITIVE FEATURES	NEGATIVE FEATURES	MORE DETAILED REVIEW?
Hog Island	Industrial			
	1. Terminal, coal or grain.	<ul style="list-style-type: none"> 1. Loop track possible. 2. Frontage on active deepwater channel with easy lake access. 3. Unified ownership (county) and control of trackage (BN). 4. Tax base from what is now public land. 	<ul style="list-style-type: none"> 1. Filling of wetlands required. 2. Uses waterfront land for unloading and storage of commodity. 3. Eliminates upland wildlife habitat. 	Yes
	2. Non-water related	None Apparent	<ul style="list-style-type: none"> 1. Consumes waterfront resource for non-waterfront use. 	No
	Commercial			
	1. Commercial fishery, aquaculture.	<ul style="list-style-type: none"> 1. Commercial use with minimal impact on land and waters. 2. Tax base from what is now public land. 3. Development of a resource not yet considered in this area. 4. Notoriety of facility and area if successful. 	<ul style="list-style-type: none"> 1. Many legal and regulatory obstacles because this has not been done before. 2. Carrying capacity of the lake unknown for the resource. 3. Cash flow in this operation is negative for several years after start up. 	Yes
	2. Restaurant	<ul style="list-style-type: none"> 1. Natural setting on waterfront. 2. Minimal impacts on land and waters. 3. Small enough for other uses to also exist. 4. Tax base from what is now public land. 	<ul style="list-style-type: none"> 1. Access and visibility not direct. 2. Site development costs higher than in developed areas. 3. Market unknown. 4. Loss of upland wildlife habitat. 5. Potential for adverse impact on waterbirds using area in the fall. 	Yes

AREA	USE	POSITIVE FEATURES	NEGATIVE FEATURES	MORE DETAILED REVIEW?
Hog Island	Commercial			
	3. Hotel, motel	<ol style="list-style-type: none"> 1. Natural setting, views, quiet. 2. Small enough for other uses to also exist. 3. Tax base from what is now public land. 	<ol style="list-style-type: none"> 1. Lack of market for both the new Barkers Island hotel and this site. 2. Impacts on upland wildlife habitat. 3. High utility costs. 4. Potential for adverse impact on waterbirds using area in the fall. 	No
	4. Small boat facilities	<ol style="list-style-type: none"> 1. Easy access to bay. 2. Space for parking and land based facilities. 3. Small enough for other uses to also exist. 4. Tax base from what is now public land. 	<ol style="list-style-type: none"> 1. Would require dredging or wetland alteration to offer protection for unattended small boats. 2. <i>Dilutes desirable concentration of this activity at Barkers Island.</i> 	No
	Residential			
	1. Single family detached	<ol style="list-style-type: none"> 1. Unique, natural setting. 2. Wetlands need not be impacted. 3. Tax base from what is now public land. 	<ol style="list-style-type: none"> 1. Numbers required to offset utility and site costs would probably consume entire site. 2. Market unknown. 3. Loss of upland wildlife habitat. 4. Eliminate public access to water edge. 	No
	2. Medium density residential, townhouses	<ol style="list-style-type: none"> 1. Unique, natural setting. 2. Wetlands need not be impacted. 3. Tax base from what is now public land. 4. Clustering would concentrate site impacts and lessen site development costs. 	<ol style="list-style-type: none"> 1. Market unknown. 2. Loss of upland wildlife habitat. 3. Site development costs high. 	Yes

AREA	USE	POSITIVE FEATURES	NEGATIVE FEATURES	MORE DETAILED REVIEW?
Hog Island	Recreational Day use, trails, swimming, picnic, small boat dock.	<ol style="list-style-type: none"> 1. Natural wetlands, field and beach. 2. Large enough for scattered site uses. 3. Corps of Engineers dock (Minnesota Point) is actively used (even though deteriorated) indicates demand. 4. Provide attractive destination for increasing small boat day use on bay. 5. Sand beach with enough water depth for active swimming. 6. Road access need not cross wetlands; boardwalk can provide pedestrian access. 7. Good access point from major tourist arterial roadway. 	<ol style="list-style-type: none"> 1. Public expense to establish and maintain. 2. Impact upland wildlife habitat (dependent on level of use and design) 3. Continued public ownership, no tax base. 	Yes
	Educational Wildlife habitat interpretation. (could be part of use above on less formal level)	<ol style="list-style-type: none"> 1. Minimal disturbance to wetlands and habitat. 2. Roadway would not need cross wetlands; boardwalk can give pedestrian access. 3. Close to residential neighborhood. 	<ol style="list-style-type: none"> 1. Western Waterfront Trail in Duluth provides more varied wetlands and habitat for observation. 2. Limited user groups; dependent on interpretive program or personnel. 	No
	Habitat Management 1. Total conservation and protection.	<ol style="list-style-type: none"> 1. No impacts on wetland and upland habitat. 2. Remains as informal, although difficult to reach, recreation area. 	<ol style="list-style-type: none"> 1. A public resource is available to very few human users. 2. No tax base or public use. 	No

AREA	USE	POSITIVE FEATURES	NEGATIVE FEATURES	MORE DETAILED REVIEW?
Hog Island	Habitat Management	1. Provide nesting habitat for Common Terns and Piping Plovers.	1. Drastic aesthetic changes with removal of vegetation. 2. Large area, connected to mainland, possible predation. 3. Other such projects at better sites are being developed.	No
	No Action	1. No impacts to wetlands or habitat. 2. Preserves options for future uses. 3. Remains as informal, although difficult to reach, recreation area.	1. Unplanned or undesirable use may occur by default.	Yes

The following uses were identified as being worthy of further review:

Ore Dock	Loading facility; coal, wood pellets, grain. No Action.
Hog Island	Shipping Terminal; coal or grain. Aquaculture Restaurant Medium Density Residential (townhouses). Recreational Day Use. No Action.

These "survivors" will now be reviewed individually.

Ore Dock - Shiploader

The dock represents a major engineering work which was, of course, designed and built to load vessels. The intrinsic suitability of the structure for this purpose remains. Its physical suitability however, is only one part of the question, the other being one of markets. In that regard, there are forces

working against Great Lakes shipping as a whole, particularly export, that should be mentioned.

Increasing St. Lawrence Seaway toll rates, the proposed system of user fees and full cost recovery for the commercial use of ports that are maintained by the Army Corps of Engineers, the draft and vessel size limitations within the system and the seasonal nature of the system are all impediments to Great Lakes port activity. The deep draft port interests on the East, West and Gulf coast ports, with their larger constituencies, tend to support the full cost recovery concept because they feel a more competitive position with such a system. Use of the Mississippi River as a feeder to the Gulf Coast is another variable in this equation.

On the positive side, the basic cost of land transportation compared to water transportation and the proximity of this harbor to the sources of material, are basic forces in favor of continued and expanded markets for coal, grain and perhaps two relatively new commercial energy sources, wood pellets and peat. *In the more distant future, other benefited non-ferrous minerals such as copper, nickel and manganese may be marketable.*

Coal appears to be an immediate possibility. The competitive position of shipping from Superior to export markets is assessed differently by various people. Variables are rail haul contract prices, Seaway tolls, user fees, topping up in Montreal or not, East coast port demurrage, size of vessel to ultimate destination in Europe, BTU content of coal, modification of boilers for the end user and on and on. A research proposal entitled "Economic Analysis of the Competitive Position of

Northern Great Plains Coal Exported through Great Lakes Ports" by Jerry E. Fruin from the University of Minnesota is presently being reviewed for funding through the Sea Grant Program. If funded, this work will consider these and other economic forces for yet one more set of findings on this question. It is neither within the scope nor the purpose of this report to answer these market questions but rather to consider these forces in discussing potential re-uses for the dock; and coal certainly appears to be a good candidate.

Grain movement out of this port will continue to be a dominant activity. It is seasonal in two respects, the navigation season and the production season of the grains. Some grains, such as sunflowers, are harvested late enough in the season that they are carried through the winter in storage.

There is a trend to a greater on-farm storage where the producer can benefit from some choice in pricing and subsidies for material that is held off of the market. Increased through-put capacity of the port benefits this pattern of less on-site storage. The present status of the port is that, despite fluctuations in the shipment of this politically sensitive commodity, the port could benefit from additional facilities that would increase both the storage and through-put capacity.

Wood fuel products such as pellets, chips, and even sawdust are receiving more attention for both domestic and export use. In Ashland, the electric utility, Lake Superior District Power, is burning 1/2 sawdust and 1/2 coal in their boilers at about \$1 per ton for sawdust and \$40 per ton for coal. Sawdust is difficult to transport any distance and the wood pellets offer more promise for wide distri-

bution. Pellets are clean and easy to handle although somewhat sensitive to moisture in storage and can break apart if handled too much or dropped from too great a height in loading.

Present economics of pellet production require almost no cost for the raw material which is generally residue from other forest products. At 17 million BTU per ton, wood pellets represent about 68% of the heat value of coal. Whether or not this material can be marketed at a profit within the limits of proper forest management is yet to be seen. The resource appears to be present in a quantity that will allow for proper rotation of the growth stands, but the market is not fully known. Briquettes are another form of utilizing wood residue, but they do not lend themselves to screw auger feeding, which is an automated means of heating with wood.

Other materials which might utilize a loading facility include peat and non-ferrous minerals such as copper, nickel and manganese. Peat is plentiful in northern Minnesota and may be marketable as a fuel source. Copper, nickel and manganese are also found in northern Minnesota. These are not present in high concentrations which would suggest that beneficiation at the mine would take place to reduce the volumes of material being shipped. The commercial potential of these resources is unknown.

In reviewing which of the above mentioned commodities might be loaded from this dock, the emphasis centers on a facility that would be flexible so that several commodities might be loaded. Large inland dead storage combined with

live storage in the dock would provide this flexibility. As a result, market changes in one material would not limit the continued use of the dock for loading other commodities. For example, if coal was the primary commodity, yet a vessel was due that was calling for wood pellets, pockets on one side of the dock could be preloaded with coal allowing a reserve of coal to be available for shipment even though the conveyor might be drawing another commodity from dead storage for loading off the other side of the dock.

The dock would not carry train traffic, eliminating the need for extensive deck repair to carry the static and traction loads imposed by train movement. Also, the use of unit trains and loop tracks has become the standard mode of efficient material handling which is not compatible with trains on the trestle. Inland property would be used for the transfer of the material from the unit train to dead storage with a conveyor movement to the dock itself.

This pattern of land use would not consume valuable waterfront property for dead storage. This leaves the land of Hog Island separate and available for other uses as will be discussed later.

Dust is an ever present concern for loading of this type. Moving the storage inland may reduce this problem somewhat as direct off-lake winds would not act on the storage piles. The dock and the inland property are within attainment areas in the city. While not relieving the project of the necessity to incorporate dust control measures, meeting air quality standards would be less difficult than in a non-attainment area.

A clear advantage would be the removal of impacts on the waters since much of the activity with the potential to produce dust would be removed from bay. Some amount of spillage could be anticipated but minimizing the amount of handling near the water would reduce the in-water spillage. With the in-water portion of the complex already in place and the slips in need of only minimal dredging, potential impacts, resultant mitigation measures and required permits would be reduced.

The discussion above relates to a facility for storing and loading heavier bulk commodities such as coal, wood pellets, peat and other minerals as mentioned. The other major commodity to review is grain, which because of its enclosed storage requirements and need for cleaner handling, is apart from these other materials. To utilize the dock for grain shipment might take several forms:

Inland Storage in Bins with Conveyor to Dock

While this technology is available and would provide great storage capacity this scheme does not seem ideal because a) the trend of greater on-farm storage favors through-put capacity rather than great amounts of storage and b) grain could not share a conveyor with coal, peat, wood pellets and other commodities discussed because of contamination from the heavier, less clean materials.

Unloading and Storage at the Dock

Considerable effort has gone into reviewing the potential of unloading trucks and rail

cars near the dock and storing grain within the dock in the pockets and bins placed inside the dock structure. The physical adaptability of the dock for this storage and loading has been demonstrated by a proposal for such use presented to Burlington Northern railroad. As proposed however, this would be a single commodity dock. The general scheme for grain handling as proposed would not preclude the type of facility described above for coal, peat, wood pellets and other minerals. One side of the dock could be grain unloaded from trucks or trains near the base of the dock and the other side of the dock could be fed by conveyor for the other heavier materials.

Although it seems physically possible to achieve this loading of diverse materials from one dock, several non-physical issues suggest that the grain component of this selection not be included:

1. The unloading operation between 2nd Street and the dock would affect the general aesthetics of the area. This is the area where one gets the first views of the water upon entering the city. The traveling public is often looking for access points to the water in this area. The unloading activity would add clutter and obstacles to this sense of contact and access.
2. Truck traffic on 2nd Street and their turning movements off of and onto the major arterial and to visitors using this major tourist entry point. Truck traffic would not go down the embankment to only have the grain lifted up

again, so the visual impact of the truck parking and maneuvering would be presented at the 2nd Street elevation.

3. The rail car unloading would not be able to utilize a loop track. The proposed siding would require the breaking of a unit train which would increase the on-going costs of this unloading by necessitating switching movements. The negative aspects of the truck hauling could be eliminated by using rail only, but this would leave the facility vulnerable to interruptions in service from strikes or other suspension in rail service.
4. To use one side of the dock for grain only would reduce the capacity of this dock that has the ability to handle heavy material.
5. Cargill Elevators C and D in Duluth are presently idle. These structures were built for grain and it would appear to be less expensive to refit these for efficient through-put than convert a structure designed to load heavier material.

The reuse of the dock for active shipping would benefit the city and region by further strengthening the port operations. The ownership of such a system includes several choices. It could remain in Burlington Northern ownership and be operated by them. A lease between BN and another private operator might be to their mutual advantage or, the general purpose nature of this

operation might suggest ownership and/or operation by the Superior Harbor Commission or some other public entity.

In summary, the proposed loading facility, given adequate markets and supply, would:

1. Provide revenues to the owner and operator as well as tax base for the public.
2. Provide for fuller utilization of existing facilities in the lower harbor adjacent to deepwater channels.
3. Not severely impact surrounding lands or waters (assuming adequate dust control).
4. Not compromise the potential use or activities on Hog Island.
5. Not disturb the open space wetland around the mouth of the Nemadji River.

Ore Dock - No Action

The other possible choice for the dock area is no action. Because of the great cost associated with its refit as described above, the market potential and contracts for suppliers and end users would need to be in hand before undertaking such activities. Lacking strong market potential, there are advantages to no action; taxes are minimal (\$8,000 per year), and there are no other apparent on-going costs. It is unlikely that any portion of the

structure that is not now in need of repair would deteriorate further, and of course, in the absence of a strong market, no action preserves the options for future use at almost no cost. This lack of action does nothing to benefit the public in terms of tax base, job base or port vitality. Private industry cannot be expected to respond on the basis of these factors however.

Although no action implies that no adverse impacts will occur, an undesirable pattern of harbor development might be established if sites without existing facilities or which are adjacent to more valuable habitat are used instead. Upper harbor sites in particular should be examined carefully since their use would require greater dredging activity than lower harbor sites. This is of concern for two reasons; potential water quality impacts and increased costs. With increasing competition between ports and the Corps of Engineers proposed system of full cost recovery, these concerns grow. If we do indeed face times in which the port activity will diminish, as some long range scenarios suggest, the importance of consolidating the harbor activity and resultant maintenance, for which the local units of government might become responsible, becomes even greater. This is not to suggest that upper harbor facilities (consistent with the Harbor Plan) should not be built, but rather that this should not happen without consideration to the utilization of lower harbor, in-place facilities to avoid a leap-frog pattern of investment and development that may become a larger public burden to maintain.

Hog Island - Industrial

Potential industrial uses include a terminal for coal, grain or other bulk commodities. Assuming a unit train type of loading, the central question to be resolved is one of permits for any necessary filling of wetlands or open waters. Map 7 illustrates the centerline of a loop track based on the following:

Maximum operating degree of curvature 10°

Track centerline radius = 575' where

$$\text{Radius} = \frac{50}{\sin(\frac{1}{2} D)} \quad D \text{ being degree of curvature}$$

As illustrated, the clear length of this loop would be about 5000' and the area to be filled about 24 acres. Two causeways could be built for the open water and would soon become stagnant. This area could be filled for additional storage capacity. The loop would include an area of about 45 acres within the trackage. The bearing capacity of the soil over much of this area is not adequate for stockpiling many products without significant alteration. Comparing these dimensions with other facilities in the harbor, both the length of track and the acreage appear marginal.

Impacts on the wetlands, open water and upland habitat would be numerous. The upland areas would likely be eliminated and the wetland greatly reduced. The potential for spillage in the open water would exist and would have a greater impact on fish and birds in these shallow areas than in a deepwater area. A study on coal dust entering the harbor waters



from the Superior Midwest Energy Terminal¹ indicates that the coal dust generated from loading a vessel was low compared to that which was wind blown off the pile. Most dust from the pile is generated by the grooming of the pile and pushing the coal into the trench fed loader. The report also comments that older storage facilities on the water's edge contribute coal dust to the harbor waters. This potential dust load in the shallow areas would be detrimental to the fish and waterfowl habitats present. While these wetland and upland habitats are not large in the context of the overall estuary, their loss would not be necessary under other uses that might be developed on Hog Island.

Hog Island - Commercial Uses

A new use that would preserve the island almost intact, but also provide for a commercial activity is aquaculture or "salmon ranching". As this is being done in other areas, primarily in Oregon, salmon, both coho and chinook, are raised in "open pasture" which for them is the sea and of course here, Lake Superior. The unique feature of these fish is that they generally return to the place of their origin to spawn. Their homing ability can be further reinforced by imprinting a smell when the fish are smolting. This strengthens their tendency to return. They are then harvested for commercial sale.

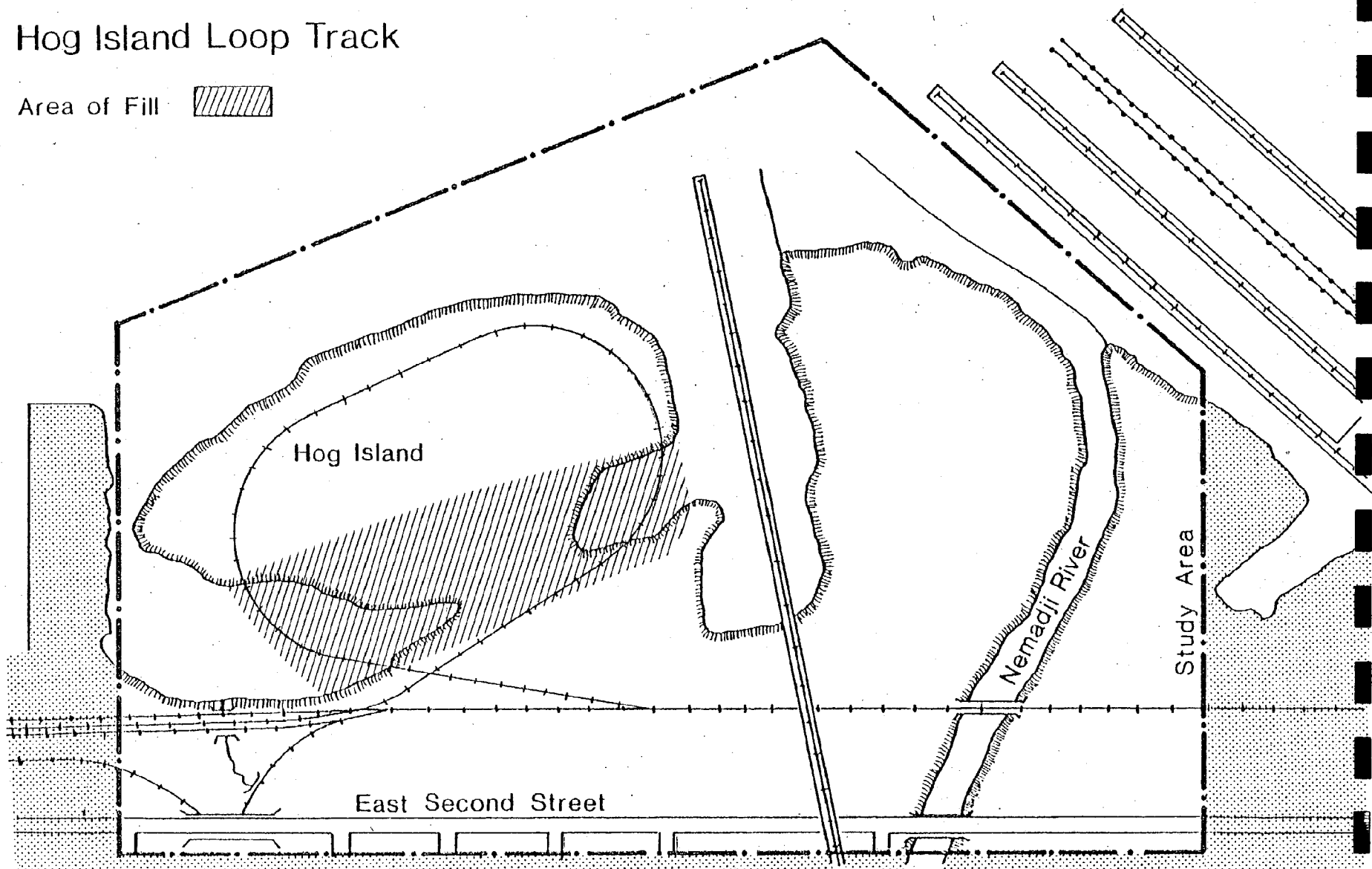
¹ "Sources and Transports of Coal in the Duluth-Superior Harbor", U.S. Environmental Protection Agency, Environmental Research Laboratory - Duluth, Michael Sydor et al., January, 1980.

NP Ore Dock/Hog Island Use Analysis 7

 N  0 500' 1000' June 1982

Hog Island Loop Track

Area of Fill 



Two basic public policy questions regarding this use are critical; 1) Is it a proper use of public waters to sustain fish for a commercial harvest? and 2) does the lake have the carrying capacity to support populations necessary for a successful commercial enterprise?

There are many examples of public facilities that benefit a private commercial activity; airports, freeways, waterway structures and aids to navigation are all local examples. A commercial fishery would provide job and tax benefits to the local economy, although not on a large scale. The only costs to the public in providing the "pasture" would relate to the competition for the finite capacity of the lake to support a commercial and sport fishery. This of course, is central to the second policy question. The biological capacity of the lake has not been quantified and is not well understood.

Even if these two policy questions were answered, great regulatory obstacles exist because this activity has been done before in this area. The political forces of the sport fishery interests might oppose regulatory changes to allow open lake aquaculture. In general, there would be great inertia to overcome in starting such an operation, even if biologically feasible. Further, it is not apparent at this time that even in the absence of any other obstacles, that such ranching would be economically feasible, given the cold waters of Lake Superior where fish growth rates are slow.

If using Lake Superior as open pasture were to be proven biologically and economically feasible, a site up the Nemadji River would probably be better suited as the imprinting at the smolt stage is enhanced in moving water.

The time for salmon ranching in Lake Superior has not yet come, but with future demands for high protein food sources, undeveloped land close to an entry to the open lake, may find a commercial fishery use.

A restaurant is a commercial use that could be built on Hog Island. A narrow causeway to give road access would be necessary but would cause minimal impact to the wetlands. A beautiful natural setting with views would be available. If the ore dock were operational again, the nearby vessel movement and loading would be interesting to view. The lack of visibility from 2nd Street would require that the place develop a "reputation". There are numerous examples of fine restaurants in alleyways, warehouse districts, waterfront industrial areas and other unlikely places where the final product is enhanced by the setting and uniqueness. A market analysis done for the Bayfront Property in Duluth commented on the few choices of interesting eating places in this area and concluded that there is "always room for a good one".¹

Surface runoff from parking could not be allowed to enter the bay directly and the utility extensions for sewer and water would be lengthy. The area is large enough to allow siting of a facility with minimal impacts. Other uses would not be precluded, however compatibility would of course be necessary.

¹ "Development Plan for Bayfront Park, Duluth Minnesota", Sea Pines Associates, Hilton Head Island, South Carolina.

Hog Island - Housing

Medium density residential development could be introduced on the island with controllable impacts. Townhouses or some other form of clustered units would be more acceptable than detached housing as the former would concentrate roadways and utilities and allow for substantial portions of the island to remain undeveloped. The physical development issues of a causeway, storm water drainage, utility extensions, soil bearing capacity and overall site design could be resolved to accommodate up to perhaps 50 units without significant impacts to the wetlands. Some of the upland habitat and resident animal populations would be affected, but the degree would depend on the specific site design.

The market and type of buyer is less clear. Orienting the housing to boating does not seem practical here in that unattended boat berthing on the outer side of the island would be unwise and on the inside would destroy the wetlands through dredging. A permanent year around home in a natural setting, close to town, would appear to be the appeal possible in such a development. The costs to develop that are specific to this site which would be in addition to regular construction costs, do not, in light of general market conditions suggest a workable project.

Hog Island - Recreation

Demand for recreational facilities has increased sharply in recent years. The response to this demand has been in part, major facilities such as Barkers Island Marina, the Western Waterfront Trail and the proposed Bayfront Park in downtown Duluth.

These facilities which require major capital expenditures, do not however, satisfy the entire need. Facilities of minimal development serve as destinations and fill out the overall recreational use patterns. The Corps of Engineers dock on Minnesota Point is an example of a well used although deteriorated facility. Day trip boaters often desire a destination to allow a stop during the day; a chance for the less-salty in the group to walk on land for a while and to amuse children and others in the party that desire diversion. Hog Island can provide such a place.

In addition to boat access the area could be approached by land by a boardwalk structure across the wetlands. This would have minimal impact on the area by eliminating the need for a causeway for vehicular access. Trails, picnic areas, and running in the fields could all be part of the low level usage of these public lands. A quiet picnic spot on the harbor away from vehicle traffic yet not a long hike from one's car would appeal to the tourist visitor in the community.

Hog Island - No Action

No action on Hog Island would not impact the wetlands or the habitat areas and would preserve options for future use. Its present recreational use by those who ford the wetlands or approach by small boat would continue. This is not necessarily bad, but more active use could be sustained without seriously degrading the natural features.

One possible result of no action is the development of a future use by default. There are several examples on the harbor where vacant or under utilized land has been developed for uses that do not require water access. The wetlands are valuable habitat and the uplands, although not unique, do contribute to the desirable mix of open space and developed areas in the harbor. To lose these natural features to a development which does not need to be on the water would be unfortunate.

Recommendations

As established early on in this report, the three basic areas within the study area will be treated separately.

Mouth of the Nemadji River

As mentioned previously there does not appear to be any compelling reason to change the use of the wetlands around the mouth of the Nemadji River. They represent a valuable segment of open space and wetlands on the edge of the city's eastern waterfront. The Harbor Plan classifies this area as "Dedicated Open Space", a classification that would not appear to compromise any harbor activity. Various goals and policies adopted as part of the Harbor Plan further support this existing land use.

The classification in the Harbor Plan and the findings of this report should be strengthened by designation of these wetlands by the state. As discussed earlier, recent action by the Wisconsin Assembly would mandate local zoning ordinances to designate wetlands over 5 acres. Uses would be limited to those activities which would not adversely affect the natural functions of the wetlands. Such zoning protection would be appropriate for these lands.

Ownership, presently Douglas County, should be transferred to the state. The regulatory influence of the state is the greatest determinant to the use of these lands, and their ownership of the lands would be appropriate.

The NP Ore Dock

Of the choices reviewed, the modification of this dock into a multi-purpose bulk commodity loader would appear to be the best use. In addition to the factors contributing to this recommendation discussed in the review of the alternatives, several goals and policies of the Harbor Plan support such use.

Industrial Goal: To promote maritime industrial activities in those portions of the harbor which are served by active deepwater channels.

Land Use Policies: Port development needs are to be evaluated and plans developed in light of possible long-term national and Seaway needs.

Major water-dependent and water-related residential, commercial and industrial shoreland developments shall be designed and constructed to minimize adverse environmental impacts, promote visual attractiveness and provide appropriate visitor facilities and public access to the water.

Those maritime industrial activities which render the greatest local economic impact are to be given priority for development.

Proliferation of individual, single purpose piers and mooring facilities are to be discouraged in favor of clustered public or private community facilities.

Transportation Policies:

The transfer of goods from one mode of transportation to another is to be made as efficient as possible.

The system should not cause vessels to take unreasonably long routes within the harbor.

The system should not create unnecessary conflicts with land transportation systems.

In addition, the proposed use appears to be consistent with the other policy statements in the plan not recited.

General Description

The proposed complex would utilize property near where the old trestle touched down to grade (and now removed). This area is bounded by the BN tracks in the 25th Avenue corridor on the Northwest, the CNW tracks on the Northeast, 31st Avenue on the Southeast and Grand Avenue on the Southwest (Map 8). This parcel is about 3000' square or 207 acres and is owned by Lakhead Pipeline. The site provides level, undeveloped land, immediate access to the

Stinson rail yards and 25th Avenue trackage (which does not require the rail traffic to penetrate into downtown) and access to a designated truck route on Stinson Avenue in an industrial setting in the city. The trestle for the dock terminates at the easterly corner of the property. A well developed and maintained residential neighborhood is adjacent to the Northeast edge of the property.

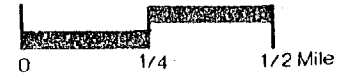
A schematic design for this site (Map 9) would include a loop track around the perimeter with a car dumper at the west end. A berm with a conveyor, up to 2000 feet long, would carry a stacker that could distribute various materials to be stored on the site. Several separate storage piles could be placed allowing for several owners or rental of space in the stockpile area. Two electric bucket wheel reclaimers (one for each side of the berm) could move about the site to which commodity was desired on the dock, link up with the stacker (new reversed to feed the berm conveyor) and the material would be taken to the eastern end of the berm to a transfer station where it would be lifted to an enclosed conveyor built on the existing trestle for its trip to the dock about 3/4 mile distant. Since the dock is no longer carrying the load of train traffic, it would be simple to engineer a wider span over 2nd Street allowing for the widening of that roadway. The roaming reclaimers eliminate the need to groom the pile to make it feed into a trench type plow feeder, a system that is prone to generate dust. The plow feeder also limits the system to only one commodity.

A smaller yard could be developed for stockpiling commodities delivered by truck. A hopper

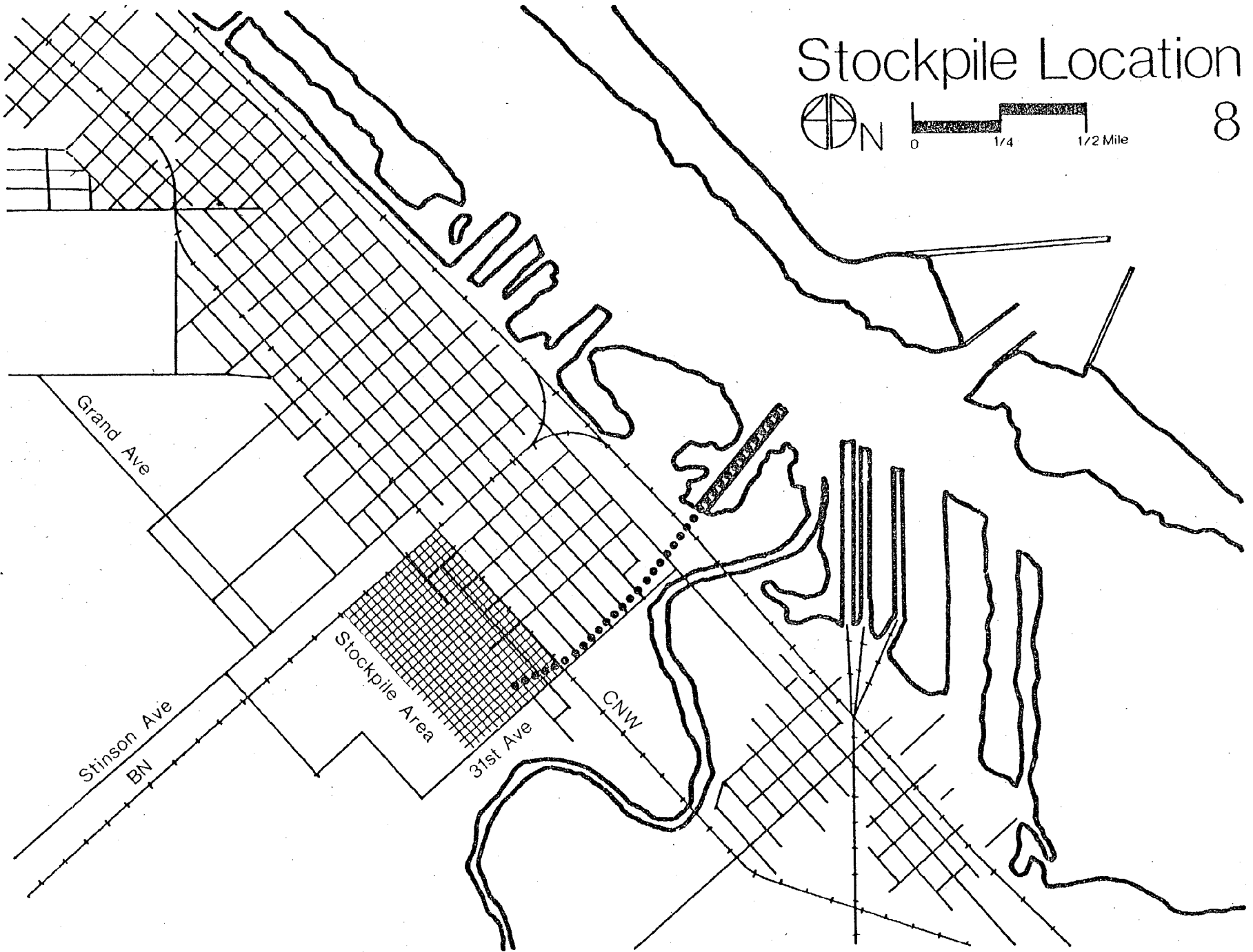
Stockpile Location

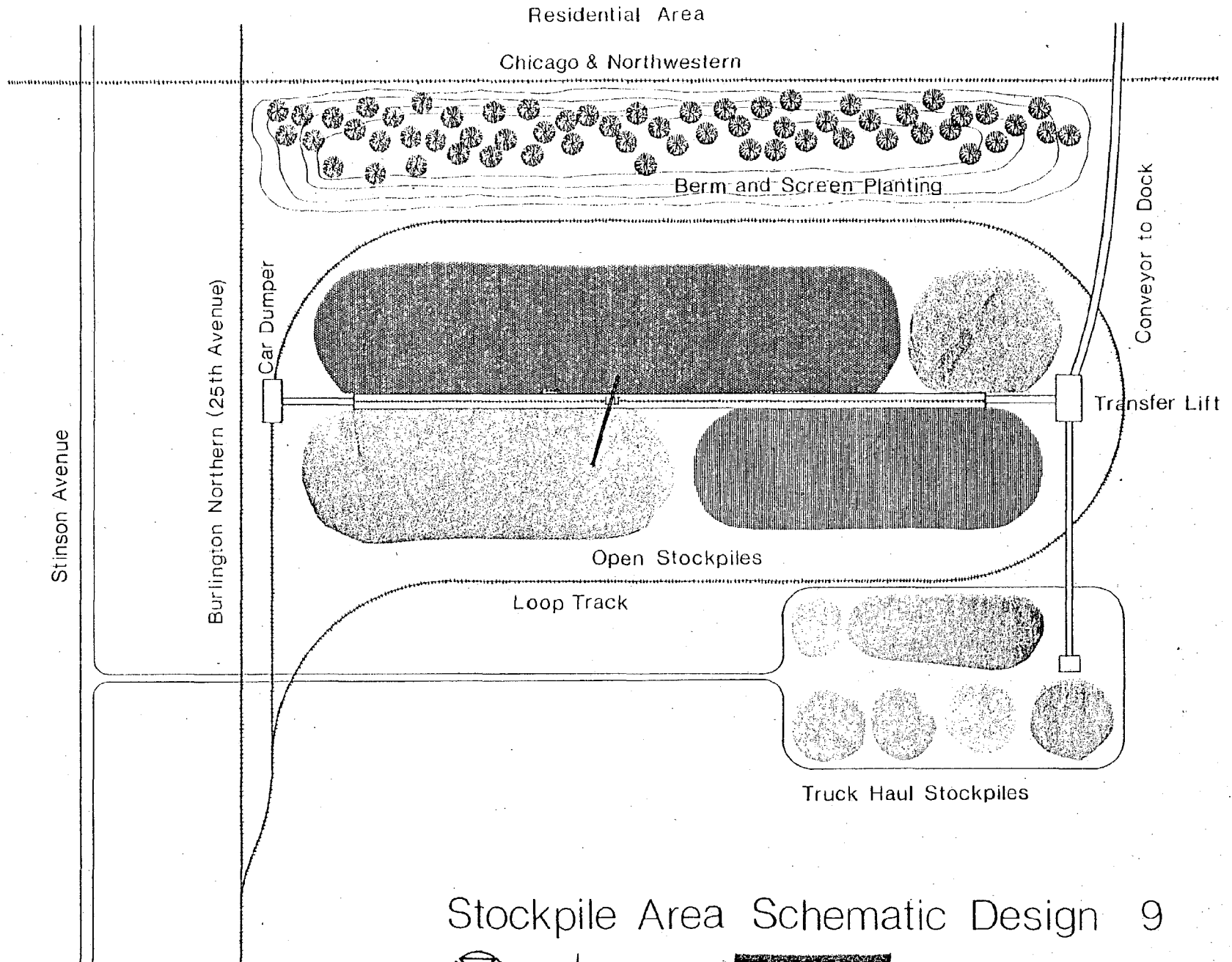


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Stockpile Area Schematic Design 9



and conveyor would connect to the transfer lift to connect the dock conveyor. With this design, trains could be unloading at the same time a commodity is being drawn off the truck haul stockpiles.

At the dock, a short tripper would divert the material into the pockets in the dock. Although the pockets would be utilized, the spouts would not. The spouts themselves are in good condition, but all of the lifting machinery appears to be inoperative. Also, this method of loading is relatively labor intensive. What is proposed is a shiploader on tracks that would run at the level of the bottom of the pockets, one on each side of the dock. The pocket doors would be modified to be controlled by this loader. Discharge from selected pockets could be made without moving the vessel. The loader would span the doors of two pockets so that precise blending of two commodities (eastern and western coal for example) could be achieved by pre-loading every other pocket with a different material. The loader would retract behind the face of the fender wall to allow ships of various superstructure configurations to lay alongside. A loader at this level would also lessen the drop into the vessel which would help control dust and reduce possible degradation of the product being loaded.

Additional sheetpiling would be required on the west face of the dock to allow dredging to seaway depths (27'). Presently the cribbing on which the dock is built is only 26' below the waterline.

The system as described would provide choices of products to be loaded and the option of direct loading from stockpiles or reserves in pockets on either side of the dock. With this diversity, the

facility would be in a good position to respond to future changes in markets.

Costs

A preliminary outline of costs for such a project in millions of dollars:

Site Preparation, clearing, berm, grading for drainage and compacting. 200 acres @ 5000 cu. yd./ acre \$1/cu. yd.	1.000
(does not include acquisition of site)	
Loop track, 8,000 ft. @ \$100/ft.	.800
Berm, 20' high, 20' wide at top, 1:1 slope, 2000' long,	
Earth works, 60,000 cu. yd. @ \$1/cu. yd.	.060
Track & conveyor, 2500 @ \$150/ft.	.375
Car Dumper	4.000
Wheel Mounted Stacker	6.000
Electric Reclaimer (2 @ 2.000 each)	4.000
Transfer Point with Baghouse	1.000
Truck haul conveyor 700' @ \$80/ft.	.056
Trestle Modification 4000' @ \$100/ft.	.400

Trestle and dock conveyor 6000' @ \$200/ft.	1.200
Dock Surface Rebuild Strip and repair 120,000 sq. ft. @ \$1/sq. ft.	.120
Concrete Plank Deck, 120,000 sq. ft. @ \$5/sq. ft.	.600
Dock, clean and paint steel	.300
Strip spouts and gear	.100
Top Tripper	.500
Modify Pocket Doors 300 @ \$4000	1.200
Ship loaders, Design & Construct (2 @ 2.000 each)	4.000
Fender Repair, 700' Sheet Pile @ \$1500/ft.	1.050
Dredge to 27', 70,000 cu. yd. @ \$12/cu. yd.	.840
Support Facilities, Buildings	.800
Utility Extensions	<u>.200</u>
Sub Total	28.601

Sub Total	28.601
25% Contingency and Profit	<u>7.150</u>
	35.751
15% Engineering Fees	<u>5.362</u>
Total, in millions of dollars	41.113

Sources: 1982 Dodge Manual for Building Construction Pricing and Scheduling
1982 Dodge Guide to Public Works and Heavy Construction Costs
Consultant Team

Hog Island

The status of the wetlands behing Hog Island and modifications which might be permitted to occur is central to the issue of the use of this land. Policy statements in the Harbor Plan as well as Wisconsin Department of Natural Resources regulations and policy speak against wetland filling or alteration. Recent action within the Wisconsin Assembly is moving towards stricter control of these areas through local zoning control. These regulatory realities suggest that development of this area would be limited to actions of minimal impact on the wetland areas.

This does not necessarily imply that only those uses which might be approved are considered. For Hog Island, the recommendation of recreational day use is a very suitable one and one for which there is apparent demand. This proposed use would require minimal construction and would leave the lands and waters much as they are. Also, in our judgement the liklihood of developing access and public use on this land is enhanced by a "minimal" design.

General Description (Map 10)

Two types of access to the island would be available; a boardwalk over the wetlands and docks for small boats. The land approach would include a parking area below the railroad tracks. Appropriate signage on 2nd Street would direct users to this lot along an access developed on the alignment of platted 20th Avenue. From this lot, a boardwalk on pilings would span the wetlands to higher ground on the island. Once on the island, the user

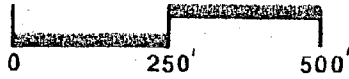
would find paths giving access to various areas and features of the island. Very little clearing for these paths would be required as the vegetation is sparse over much of the island. The area on the island side of the wetlands is about 50 acres. The loop trail around the perimeter of the island is just over one mile. Picnicking, beach walking and running, swimming, vessel watching and general outdoor activities would be the uses on the island itself. Winter uses would include cross country skiing on the trails. No utility extensions would be needed. Pit toilets would serve sanitation needs.

Small boat access would make this area a very attractive destination for day users. There are limited places to "go" in the harbor and those that exist are well used. Small docks could be built that would provide capacity without extending into very deep water. Six foot draft at the ends of the docks would be desirable, although the majority of the boats using the facilities would probably draw in the four to five foot range.

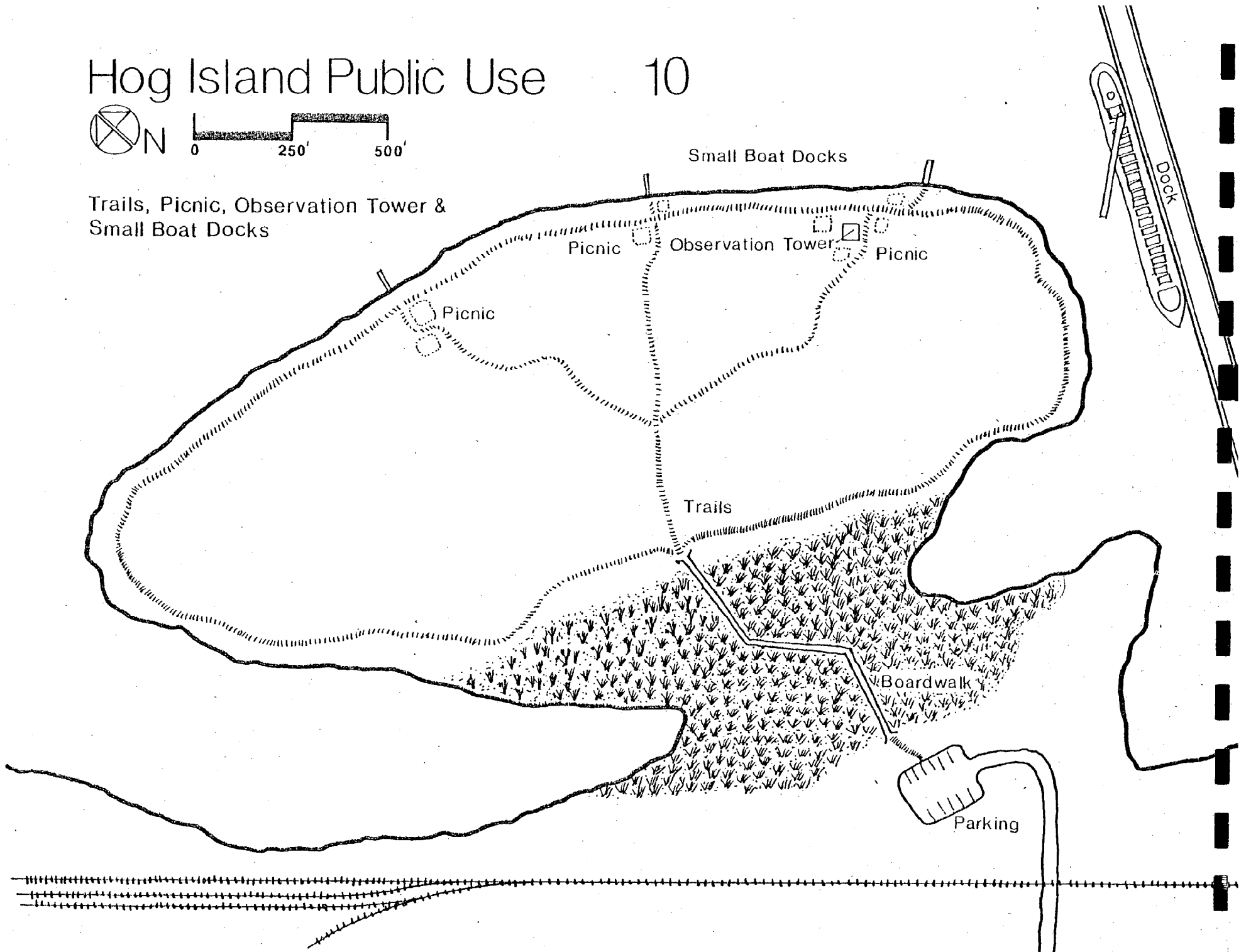
One of the most striking views in this portion of the city is from the end of the adjacent ore dock. To underutilize the dock to give the public the benefit of this view would not be reasonable, but much the same view could be had on adjacent Hog Island with one interesting addition; the ability to watch the vessel traffic and ship loading from a safe vantage point. This view could be obtained by the construction of an observation tower or platform. The design of this structure might be similar to those found in various state parks. This is not to be confused with the typical fire tower which tends to

Hog Island Public Use

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Trails, Picnic, Observation Tower &
Small Boat Docks



be less rigid and not suitable for public use. A pole structure of a height of 60 feet at the easterly end of the island would provide excellent viewing of the harbor, the two cities, Minnesota Point, vessel loading, the Superior Entry and Lake Superior.

By having no vehicles present, the sense of the island is maintained presenting a unique, undeveloped setting in the midst of an active harbor with its mix of shipping industry and recreation. Especially the visitor from outside the area would find this to be a new experience of quiet sand beaches, ocean vessels, open fields and with the view from the tower, the realization that this is all in the context of a metropolitan area.

Operation

The appropriate authority to construct and maintain this facility is not clear. The State, County and City are obvious candidates, but with appeal that is far wider than the neighborhood or citywide use, state or county operation would seem appropriate.

The low level of development and minimal construction would lend itself to summer work projects for crews made up of teenagers, adults, and even seniors who, with the direction of a leader, materials and minimal pay could create a place of pride. Another source of development potential would be civic groups, sportsman's clubs or fraternal organizations. These groups often develop a sense of pride for their work and could be engaged in ongoing maintenance and operation.

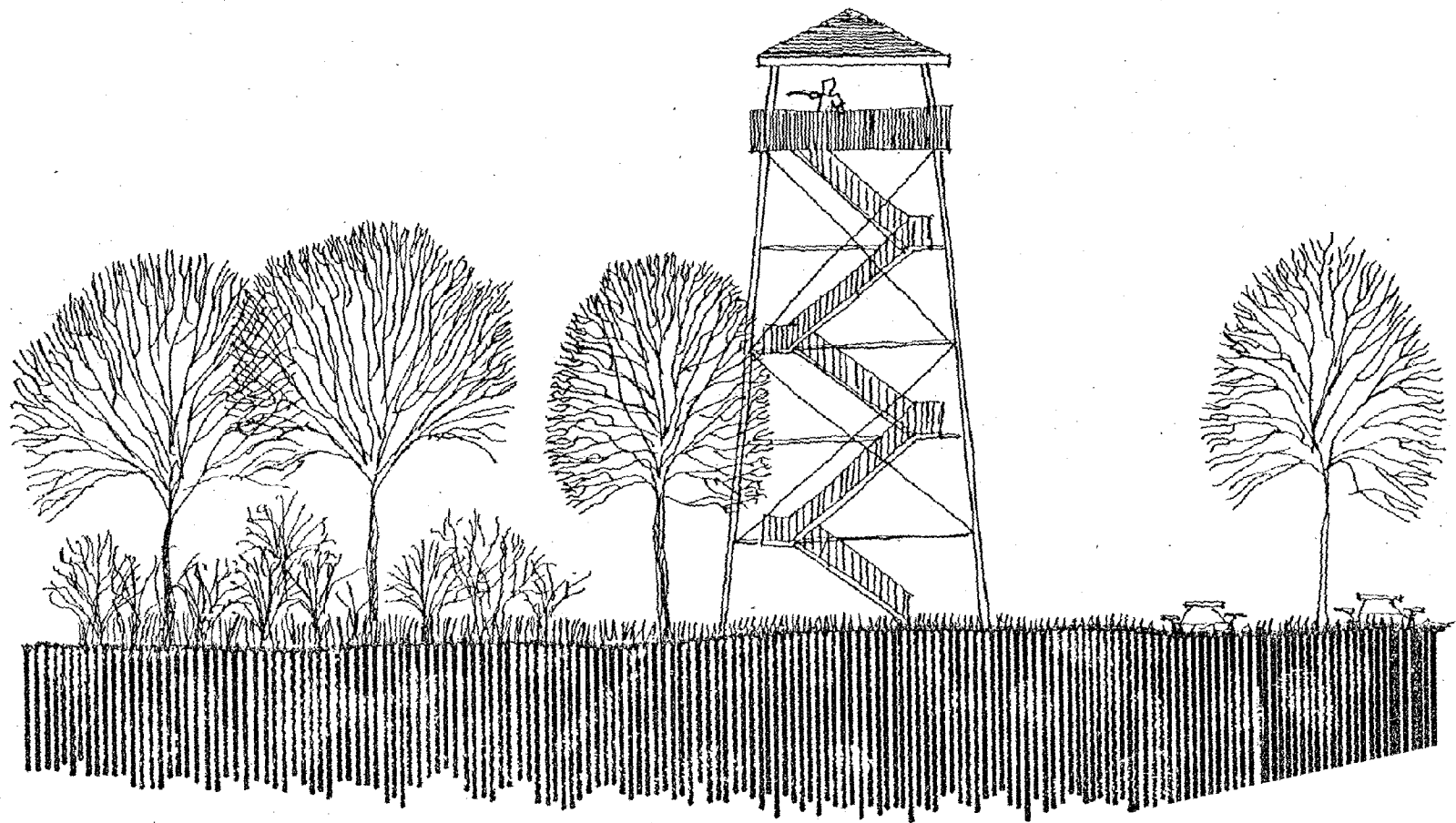
Costs

These preliminary cost estimates for development are based on contractor construction, which of course would be considerably higher than undertaking the project by work crews. The facilities are broken into smaller groupings to allow for staged construction and also to avoid the concentration of use in one site.

Access Road, 700' @ \$12/ft.	\$ 8,400
Parking Area, 20 cars, 8000 sq. ft. @ \$1.50/ sq. ft.	12,000
Boardwalk, 5' wide timber 750' @ \$20/ft.	15,000
Trails, clear, grub and grade 8000' @ \$1/ft.	8,000
Picnic Sites, table and grill, 9 @ \$600	5,400
Docks, 40' long, concrete pad, steel tube column, wood deck, 3 @ \$8,000	24,000
Observation Tower, Pole construction, 60' high	<u>20,000</u>
Sub Total	\$92,800

Observation Tower

No Scale



10% Contingency 9,280

Total \$102,080

To phase these costs, of course requires only picking the components required to get underway. For example, the minimal development might consist of:

- Access Road and Parking Area
- Boardwalk
- 1/2 Trail length illustrated
- Three picnic sites
- One dock

This cost would be about \$50,000, again using contractor prices.

Source: Cost Data For Landscape Construction, 1981
Kerr Associates, Inc.

Closing

This report in itself will not create strong markets for coal in Europe, wood pellets in Africa or grain in Asia. The proposed recreational use of Hog Island will not happen on the strength of this document alone. What this report strives to do however, is to lay the ground work for future activities in this area by providing a detailed inventory of existing conditions and illustrating that a recreational use and an industrial activity can be good neighbors, independent of other.

As development potentials or natural resource management questions arise, the early identification of issues and concerns can only assist in the ultimate use or re-use of these areas.

Sources

The following reports, agencies and businesses were drawn upon for this report.

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U.S. Forest Service

U.S. Army Corps of Engineers

Wisconsin Department of Natural Resources

Northwest Regional Planning Commission

Metropolitan Interstate Committee

City of Superior

Burlington Northern Railroad

J.R. Jensen & Son, Inc.

Zenith Dredge Company

Forest Fuels

U.S.S. Great Lakes Fleet Inc.

Midwest Energy Resources

The Wood Residue Resource in Northwest Wisconsin, 1978, Northwest Regional Planning Commission and Wisconsin Department of Natural Resources, 1979.

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Western Coal/Great Lakes Alternative, conference, Superior Board of Harbor Commissioners, August, 1981.

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